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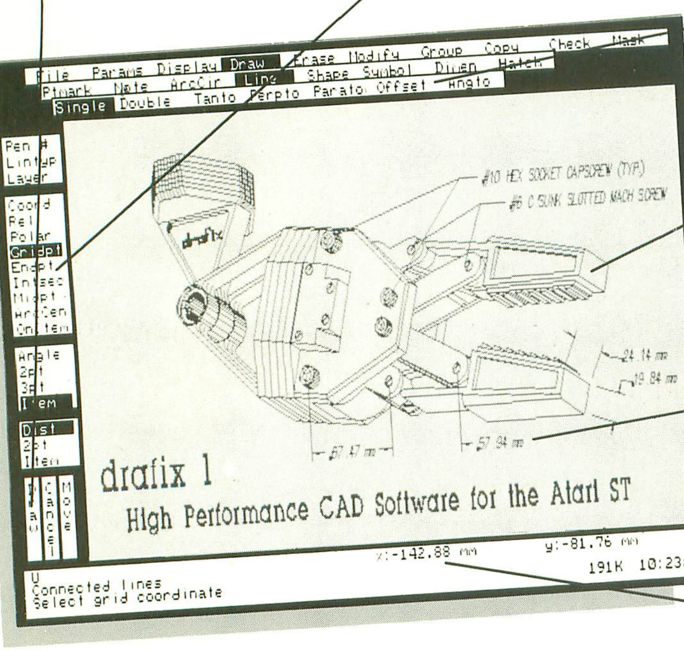
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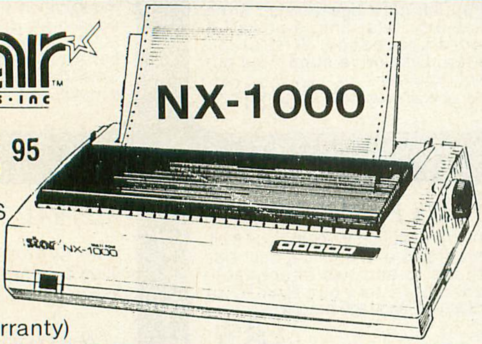
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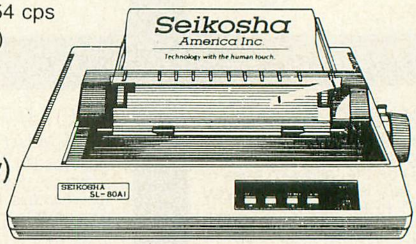
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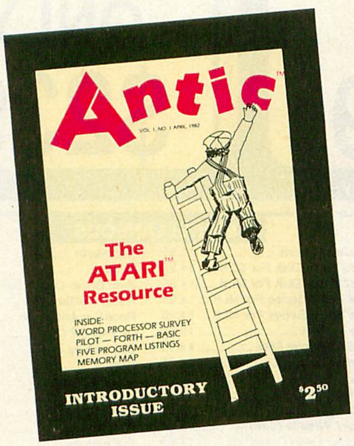
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I/O Board

ICD/OSS

*As this **Antic** issue went to press, it was announced that ICD is taking over the complete OSS product line, including MAC/65, ACTION!, BASIC XE and ST Personal Pascal. For ordering and support, contact ICD/OSS at 1220 Rock Street, Rockford, IL 61101. (815) 968-2228.*

TRIVIAL PURSUIT

Is there a program for the ST that lets you create questions with multiple selection of answers and give you a score at the end of the test, along with a printout of questions and answers? Also, where can I obtain a new ST mouse?

Larry Doss
Chicago, IL

*Pursuit of the Graf STrivial (**Antic**, September 1987), written in GFA BASIC, does exactly that. If you don't have GFA or don't want to type in the listing, you can order the disk from Antic's Disk Desk.*

Also, you should be able to purchase a new mouse for your ST from Atari Corp. at 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.—ANTIC ED

I/O OR 1/0?

I'm a retired data processing manager and I never have let my programmers use the letters I, O, S or Z as variable names. I'm sure you can see the similarities between those letters and 1, 0, 5 and 2. I even steer clear of Q, U and V—Q looks like 0, and U and V look alike.

Avoiding those variable names would make type-in listings much more likely to work the first time.

Jerome Fraenkel
Franklin Square, NY

LIGHTSPEED RELOCATES

Here's the new address for the makers of Lightspeed C (New Products, December 1987). Clearstar Softechnologies (Division of Omegasoft), P.O. Box 140, Harrells, NC 28444. (919) 532-2359.

XMM801 SOFTWARE

Regarding William Tilley's XMM801 Woes letter (February 1988), Starfleet Software has three XMM801 utility disks available for $10 each. These utilities enable the Atari XMM801 to print screen dumps in five different sizes, print near letter quality, mix NLQ text with graphics on the same page, plus much more. Starfleet is at 1037 W. Leafland Avenue, Decatur IL, 62522. (217) 423-6820.

Terry Ortman
Starfleet Software

REAL SIERPINSKI AUTHOR

The Sierpinski Curves program reprinted from Page 6 Magazine in your February 1988 issue was originally written by me for the July 1984 Creative Computing. The programs are identical, right down to the variables and line numbers. I would appreciate a note in **Antic** that I am the author.

David Ahl
Publisher,
Atari Explorer

***Antic** sincerely regrets this Transatlantic foulup. Page 6 credits for this short fractals program in their May/June 1987 issue simply stated that the "nice little demo. . .was sent in some time ago by Alan Sharpe on behalf of the Brighton Users Group."*—ANTIC ED

SCHEDULE SAVER

I work for a leading child mental health center and one of our biggest problems is room-scheduling for appointments. We decided to use an Atari 130XE to make this easier. Because the scheduling office is a high-turnover, low-computer-literacy place, one of the significant features of our system, written in Advan BASIC, is that it's user-friendly. No training time is required.

I should point out that we selected Advan BASIC because of a good review in **Antic** (June 1987). It's an excellent product, and customer support has been excellent, too.

Katherine Wilson
Brookline, MA

INDUS AID

Please tell Victor Decarlo Jr. (Indus Compatibility, February 1987) to disconnect and reconnect the I/O cables between his disk drive and computer several times to improve the contacts and make sure they're firmly in place. This often-neglected precaution fixed my own problem with Flight Simulator II on my Indus drive after a couple of infuriating months of troubleshooting.

Richard Barkley
Eugene, OR

ALL I NEED

My little Atari 800 has run a large real estate company in Daly City, California, for over two years, fulfilling all data processing needs—reports, word processing, mailing labels, etc. The original investment, excluding the printer, cost about $600. It's a sad situation for anyone to spend more than $400 (plus the printer cost) to get into computing. Atari is the one computer that more than fulfills this need.

John Mohr
Daly City, CA

CAN'T HOOK UP

Your article *Laptop-to-Atari Connection* influenced me to buy a Tandy 200 laptop to use at work. My intention was to transfer files to my Atari for storage. However, I haven't been able to get them to communicate. I've tried every combination of modems, cables, hookups and software I could think of. Can you help?

Michael Lettini
Mercer Island, WA

Go into the built-in communications program on your Tandy and make sure it's set up (parity, baud rate, stop bit, etc.) the same way as the terminal program you're using on the Atari. And make sure your Atari program can transfer ASCII files—if it can transfer only ATASCII files, you're using the wrong program.—ANTIC ED

continued on next page

PRACTICAL PATCH

Bibliography Master (**Antic**, November 1987) is a terrific program—a victory over those pedantic little rules that drive most of us crazy.

However, the program prints a line space between each printed line, and that presents a problem. Most form books and pedagogues require that each entry in a bibliography be single-spaced and that a blank line be used only (if at all) to separate the individual references.

The program can be changed easily to double-space only between reference sources (which looks nice) by inserting or revising the following lines:

```
681 DBSP=F0
691 IF DBSP=F1
THEN ? #F3:LIN=LIN+F1
1040 ? #F3:LIN=LIN+F1:DBSP=F1
```

If you just want single-spaced printouts, forget about lines 681 and 691 and revise line 1040 as follows:

```
1040 ? #F3:LIN=LIN+F1
```

Now, if someone would convert *Bibliography Master* into a program to format end notes, we'd have most of the maddening technicalities of writing academic papers just about licked.

Dwight Collin
Pittsford, NY

FAMILY ANTIC

Thanks for the programs in the January 1988 issue of **Antic**. My kids enjoyed *Rassilon's Triple-Header* and have been printing *BASIC Biorhythms* charts for their schoolmates. *Mighty Mailer* and *Antic SuperCopy* are both good programs, but I'd like to send special thanks to Rich Moore for the *SSI Joystick Commander.* (You can add Kampfgruppe to the list of games the "daring method" works with.)

Robert Smith
Reedsport, OR

WANTS ISSUE #1

The only issue of **Antic** that I don't have is issue #1. How can I get a copy?

Evan Engelkes
Council Bluffs, IA

Sounds like a job for ***Antic*** *Classified Ads.*—ANTIC ED

DOUBLE DEUTSCH

My brother bought a 1040STM in Germany and was told that he couldn't read the single-sided disks from my 520ST because of the new double-sided drives. This isn't right, is it? Also, is there a program for the ST that would help me learn French?

Gerd Knaak
Spring, TX

Double-sided drives can read single- or double-sided disks. If your brother wants

to send a disk to you, he should format it as single-sided.

The Linkword Languages *from Artworx Software (reviewed in* **Antic**, *October 1987) include a French edition and are available for the ST.*—ANTIC ED

DESIGNER MAILER

Thanks for the fine programs in your magazine. We especially like the *Designer Label* program (**Antic**, April 1987). We're using it *without* any mailer program: we compose our list on a word processor and save it to disk. Then we RUN Designer Labels and LOAD our text file. The results are perfect. The only thing to keep in mind is to press [RETURN] after each line and another [RETURN] after each address—exactly as specified when using Mighty Mailer (**Antic**, September 1987).

Charles and
David Smith
Girard, OH

DISK DESK PRAISE

I am very pleased with the Antic Disk Desk. I called in an order late one Wednesday night and received my merchandise in Saturday's mail. I might also add that your new disk price and bonus programs have tempted me to renew my subscription, but with disks.

Gordon Toomey
Rancho Palos Verdes, CA

***Antic** welcomes your feedback, but we regret that the large volume of mail makes it impossible for the Editors to reply to everyone. Although we do respond to as much reader correspondence as time permits, our highest priority must be to publish I/O answers to questions that are meaningful to a substantial number of readers.*

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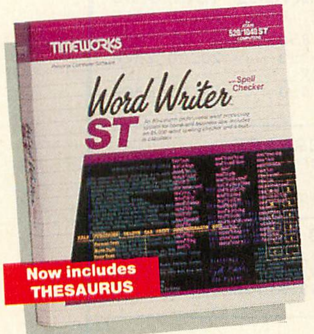
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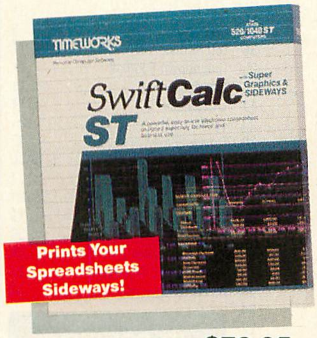
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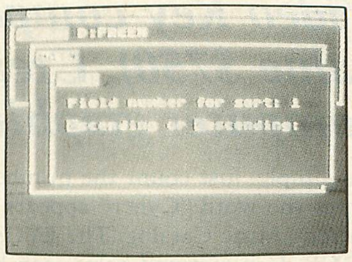
Antic Data-X

Database deluxe in Turbo BASIC

This month's Super Disk Bonus is Antic Data-X, a full-featured database program that rivals commercial software in power, versatility—and especially in ease of use. Windows automatically display all the information you'll need to operate Antic Data-X, so you don't need to learn complicated commands. The program works on Atari XL/XE computers with at least 64K memory and it also supports RAMdisks.

Antic Data-X makes it easier than ever to create, search and print out your own mailing lists, phone directories, household inventories, catalogs of your recordings, videotapes, software, magazines or books. Any kind of interactive data file will be at your command.

Antic Data-X can handle files with as many as 300 characters per field, 20 fields per record and 1,000 records per file. Besides the add, delete and update functions usually found in database software, Antic Data-X also performs additional mathematical manipulations across fields.



Antic Data-X is written in speedy compiled Turbo BASIC, but you don't need to own that programming language in order to use this month's Super Disk Bonus. The Antic technical staff experimented with a standard Atari BASIC type-in translation of Data-X, but it did not run fast enough to provide much advantage over our *Topshelf* type-in program (January 1988). However, in the pseudo machine language of compiled Turbo BASIC, Antic Data-X performs large-scale sorts lightning-fast—especially when used with a RAMdisk.

The author of Antic Data-X is Jeffrey Summers, the Rochester, NY physician who won a November 1987 Antic Practical Applications Prize for *Your Best Route.* Antic Data-X is so fast and user-friendly that it offers clear advantages over the earlier Super Disk Bonus database which appeared in the August 1987 issue.

A complete 2,500-word manual on how to use Antic Data-X is contained on Side B of the May 1988 monthly disk. To read it or obtain a printout, select choice 5, HELP.BAS, from the Side B menu.

Your May 1988 Antic Disk—featuring Antic Data-X as well plus every type-in program from this issue—will be shipped to you within 24 hours after receiving your order. Just phone Toll-Free to the Antic Disk Desk at (800) 234-7001. The monthly disk is only $5.95 (plus $2 for shipping and handling) on your Visa or MasterCard. Or mail a $5.95 check (plus $2 shipping and handling) to Antic Disk Desk, 544 Second Street, San Francisco, CA 94107.

Programmers: Antic wants to see your most ambitious programs, even those too large or complex for printing as a type-in listing. High-quality programs in any language that has a runtime version are now eligible for consideration as a Super Disk Bonus. ■

CONTEST!

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It's simple: just count the number of times the word "Cyber" appears in the current Antic Catalog. The EVC8U SONY deck pictured below can be yours. Controlled by Tom Hudson's new CYBER VCR program, it will automatically assemble, on tape, your best Cyber animations (created with the Cyber products displayed on the next page). Watch our next Catalog for details on CYBER VCR and other new Cyber products.



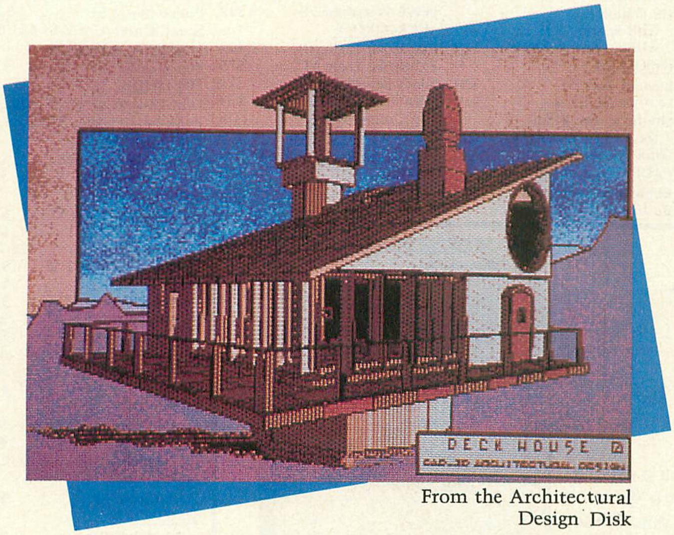
Contest Rules

Count the total number of times the word "cyber" appears from cover to cover in the Antic Catalog (issue pictured on this page). Uppercase or lowercase, as part of another word, or separate, whenever the letters c-y-b-e-r appear in sequence, they count as one "cyber." Send your total count, along with your name, address, and phone number to: CYBER COUNT, Antic Software, 544 Second Street, San Francisco, CA 94107. DEADLINE: April 30, 1988. ENTRY LIMITED TO ONE PER CUSTOMER. In case of ties, a drawing will be held to determine the winner. Contest void where prohibited.

Don't have our last Catalog? Need more info? Call our toll-free 800 line for assistance. Mention the "CYBER COUNT CONTEST."

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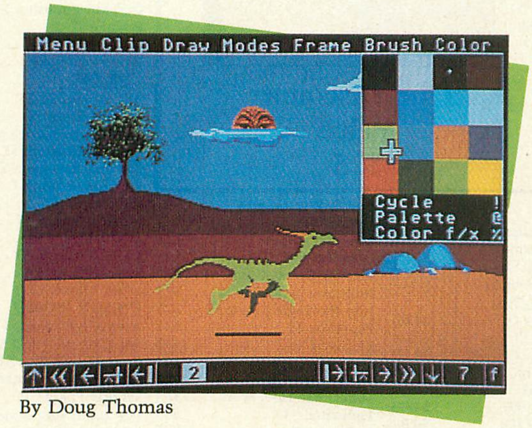
"Antic's Cyber family . . . turns the Mega ST into a desktop video animation workstation. . . little short of amazing."
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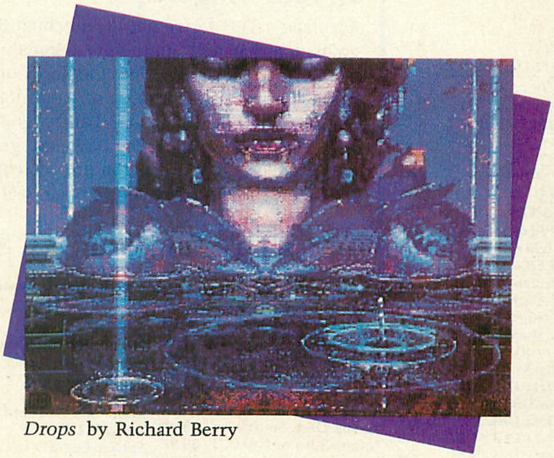
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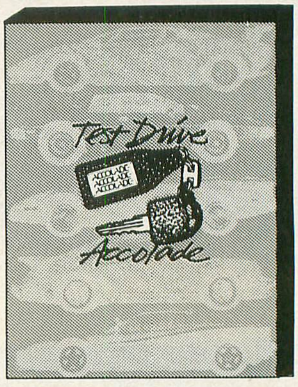
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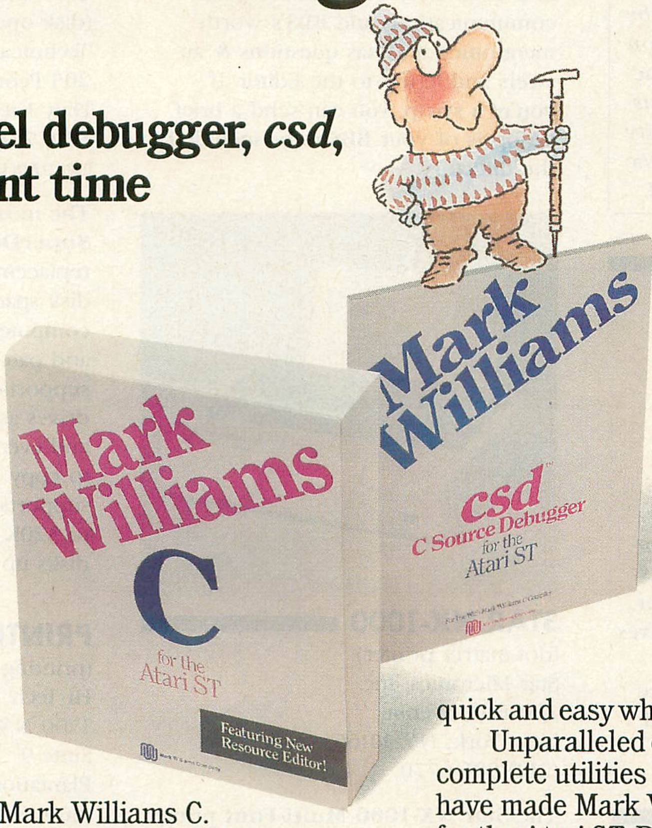
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(utility program)
Michael Holloway
3308 Rucker Avenue
Paducah, KY 42001
(502) 442-2121
48K disk
CIRCLE 168 ON READER SERVICE CARD

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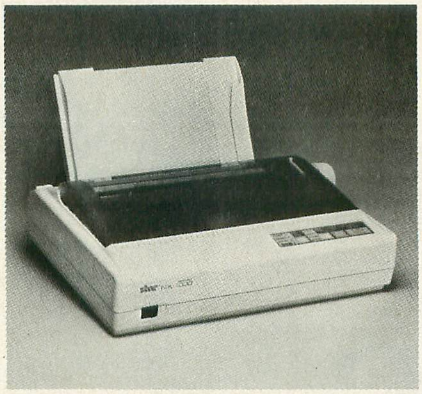
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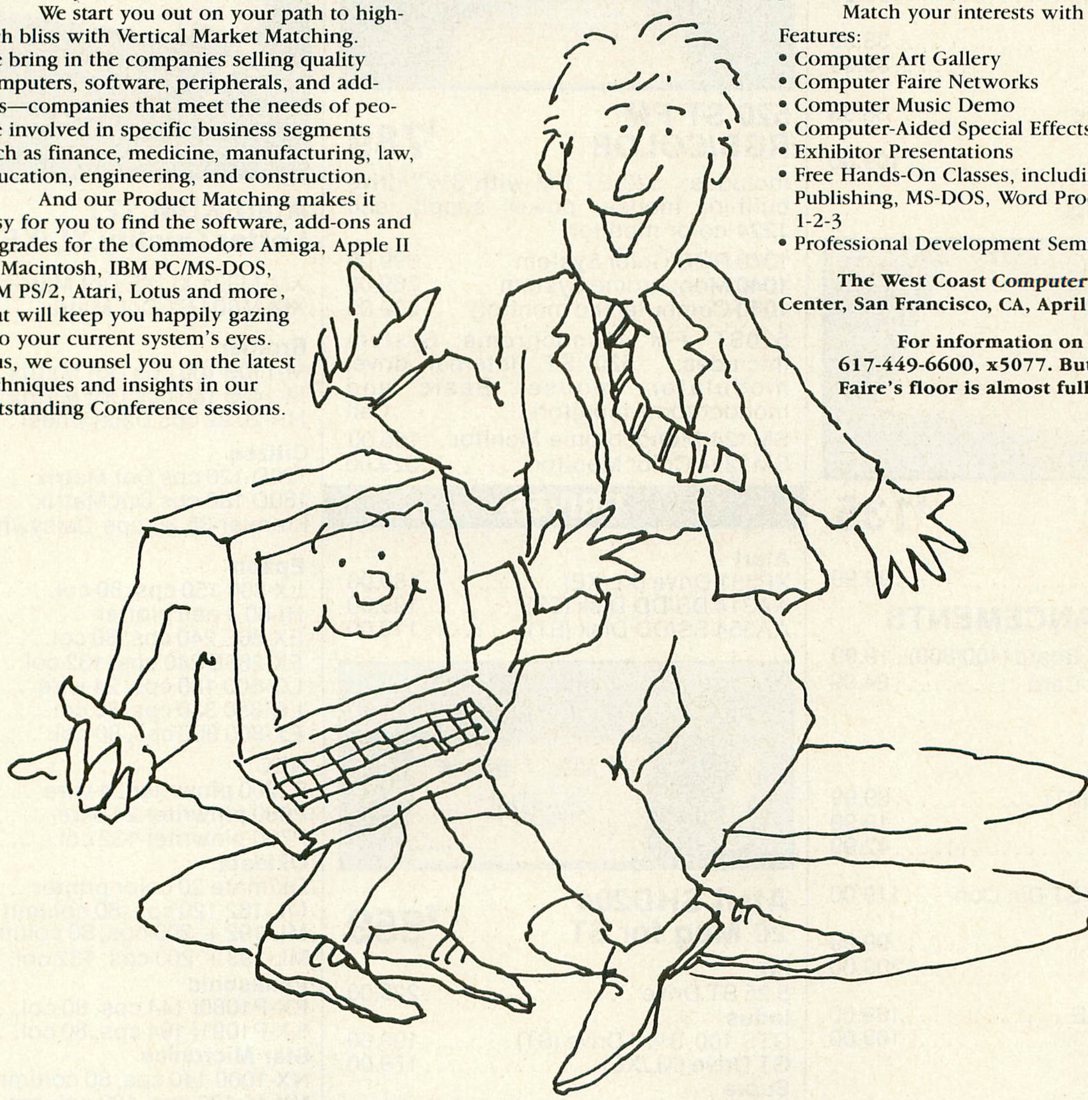
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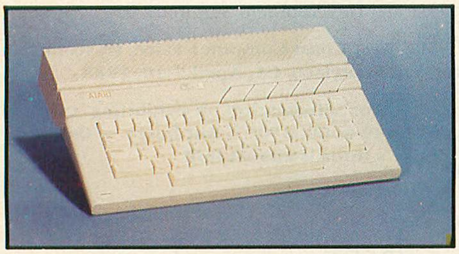
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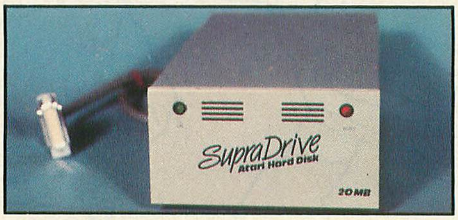
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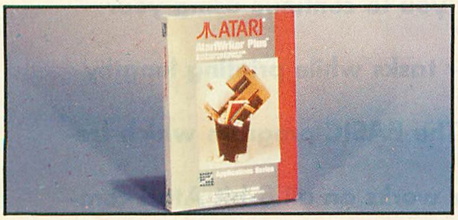
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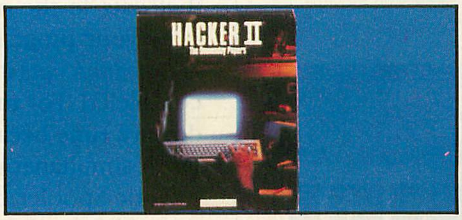
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By GLENN SMITH

Antic Spooler

Keep on computing while you print!

Antic Spooler is a short machine language printer buffer that allows you to continue using your computer for other tasks while printing lengthy program listings. The BASIC program which creates Antic Spooler works on all 8-bit Atari computers of any memory size, with disk drive.

"Is your computer tired of waiting for your printer to finish?" You've seen ads for printer buffers (also called printer spoolers). These devices—which can be either hardware or software—temporarily store data sent to the printer by your computer program and send that data to the printer, one line at a time.

As your program sends more data to the printer, the buffer intercepts it and stores it until the first task has been completed. For many applications, printer buffers really do save time because the printer and the computer can work simultaneously.

Antic Spooler creates an 8K buffer in the memory of your 8-bit Atari. Text sent to the printer is intercepted by Antic Spooler, which returns control to your computer as soon as the characters have been stored in RAM. Antic Spooler then sends characters continuously from RAM to the printer while your main program keeps on running.

ANTIC SPOOLER CHALLENGE

The MAC/65 source code for Antic Spooler, SPOOLER.M65, is 118 sectors long and can be found on this month's Antic Disk. Assembly language programmers should not find it hard to enhance Antic Spooler. This magazine would be interested in publishing the best patches or add-ons to Antic Spooler.

For example, you might want to enlarge the buffer to 16K or so, modify it to use the RAM under the operating system, or create a 64K buffer using the extended memory in the 130XE and upgraded XL computers.

As written, Antic Spooler is useful mainly for making printouts of your own program listings while you continue to compute. Maybe you could even find ways to make Antic Spooler work with some disk-based commercial word processing software. (As is, the spooler should already work with commercial cartridge software such as the original version of Atariwriter.)

GETTING STARTED

Since Antic Spooler is a machine language program and cannot be typed-in and SAVEd, we'll use a simple BASIC "helper" program that will automatically recreate Antic Spooler and store it to a disk file.

Type in Listing 1, SPOOLMAK.BAS, check it with TYPO II and SAVE a copy before you RUN it. Listing 1 will create Antic Spooler, and store it to a disk file called SPOOLER.OBJ. Antic Disk users will find a copy of SPOOLER.OBJ on this month's disk.

Copy SPOOLER.OBJ to another disk and rename it as AUTORUN.SYS. Make sure this disk also has the DOS.SYS and DUP.SYS files, too. Now reboot your Atari with this disk. The AUTORUN.SYS file will install the spooler into low memory. Your free memory will be reduced by about 8K.

Let's test the spooler. LOAD any BASIC program, type LIST "P:" and Antic Spooler will capture text and begin printing it. After the program has been LISTed, BASIC's "READY" prompt will appear.

HOW IT WORKS

Multi-tasking? No, not really. Antic Spooler modifies the resident "P:" printer handler, specifically the PUT CHAR routine. Whenever you execute a statement that PRINTs to the printer (LPRINT, LIST "P:", PRINT #), the new P: handler will store text in the spooler and increment the character counter. Then every 1/60 of a second, during the Vertical Blank Interrupt, control passes to the VBI part of Antic Spooler.

The VBI routine first checks to see if the printer is busy. In this routine, PUT CHAR takes priority over *printing*, which means that the spooler would rather *store* characters in its buffer than print them.

When the printer is free, the priority flag is turned off (set to zero), and the spooler will try to print a character.

The priority flag is turned on by PUT CHAR whenever a character is stored in the buffer, waiting to be printed.

If the priority flag was off, the VBI routine checks the result of its last attempt to print a character. If there was some problem and that character was not printed, it is re-sent until the character *is* printed.

If, on the other hand, the character was printed successfully, Antic Spooler searches the buffer for the next character. If it finds one, Antic Spooler puts it into the resident print handler buffer and decrements the character counter.

When the resident buffer becomes full, it's printed using the standard SIO vector (the same vector normally used by your printer).

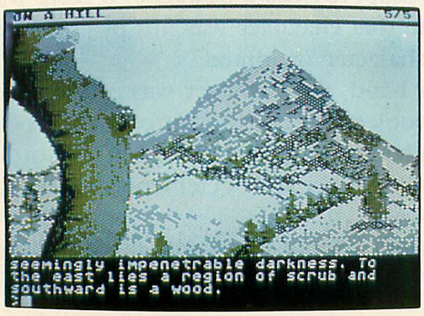
WARNINGS & DON'TS

Since Antic Spooler sends characters to the printer through the SIO vector, it's not affected by OPEN and CLOSE statements, or by the LPRINT and LIST "P:" commands. This means it will work with software that never executes a CLOSE command, which is why it works with commercial cartridge software like the original version of AtariWriter.

continued on page 26

Product Reviews

Phantasie II, Guild of Thieves



PHANTASIE II

SSI has released an exciting 8-bit Atari version of **Phantasie II**, the second entry in their premier adventure series. And while 8-bit owners will miss out on the ST version's brilliant graphics, at least now all Atarians can go another round with the evil Nikademus.

Phantasie lovers can rejoice at the prospect of sending up to six adventurers to the island of Ferronrah, over which the Dark Lord Nikademus has cast a cloud of evil. Veterans can transfer their old characters, although by doing so they forfeit most of their accumulated wealth and power. Newcomers (and those who have lost faith in their current warriors) create characters by selecting race and occupation and then watching as the computer randomly generates values for attributes such as intelligence, strength and wisdom.

As you search the island for an enchanted orb, your party will encounter a variety of creatures, most of which will have to be dispatched by force. Castles and dungeons hold treasures and dangers beyond your wildest dreams, and most players can count on hours of play before this game is completed.

As you grow in power you will wield stronger and stronger spells, defeating enemies of ever-increasing strength. But Phantasie II is a game of brains as well as brawn, so success also depends on the intelligence of you and your character.

You can use either the keyboard or the joystick to keep the action moving, using ST-like menus. The graphic displays are well designed and help keep even the newcomer right on top of the action. A generous manual completely and concisely explains the game, adding plenty of tables and charts for quick and easy reference. All in all, Phantasie II is a fine addition to anyone's software library and a must for all adventurers. Its practically transparent user interface allows you to concentrate on playing the game—on living the adventure— and isn't that really what it's all about?—STEVE PANAK

$39.95, 48K disk. Strategic Simulations Inc., 1046 N. Rengstorff Avenue, Mountain View, CA 94043. (415) 964-1353.

CIRCLE **174** ON READER SERVICE CARD

GUILD OF THIEVES

The 8-bit Atari version of **Guild of Thieves**, sequel to the popular game The Pawn, is a sophisticated graphic adventure that had me fully involved.

The Pawn transported you to the land of Kerovnia. You return to Kerovnia in The Guild of Thieves as an apprentice to a master thief. You are told to steal all the treasures in the area while being watched and judged closely.

The Pawn and Guild of Thieves are not directly connected, except that they are both set in Kerovnia and share small details. The monetary system is based on the ferg and Farthington's Ale is the local drink. As in The Pawn, commands are entered in full sentences. These include phrases such



as "Go north west and take the key." Multiple commands make things much easier for the prospective thief. To return to a location you've been through, just type in its name.

The game can be saved at different points and reloaded. This you want. A helpful feature of the command editor is the ability to take back a move by pressing the escape key. The graphics can be scrolled up or down by pressing [SELECT] or [START].

The outstanding graphics of The Pawn are matched by those in Guild of Thieves. High-resolution pictures transport you into a medieval world of thieves, castles and treasure. The only complaint I have about the Atari XE/XL version is that most of the detailed graphics had only shades of one or two colors.

The annoying copy protection scheme makes you enter a specific word from "What Burglar?" when reloading a saved game. The game also accesses the disk frequently, especially for the graphics. Fortunately you can speed things up by turning the graphics off. And if you liked The Pawn, you are sure to love this superior sequel.—JOHN MANOR ■

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CIRCLE **176** ON READER SERVICE CARD

ANTIC SPOOLER
continued from page 23

To conserve memory for your main program, Antic Spooler relocates itself to the lowest memory location possible. The program pushes your Atari to its limit. The computer wasn't designed to do two things at once, so programs won't always be as fast as you'd expect. There may even be moments when the screen freezes briefly while Antic Spooler sends text to the printer or frees buffer space for incoming characters. And since printing affects the sound registers, programs that use sound will be affected.

You should also keep the following cautions in mind: If you try to LOAD a large BASIC program over the Antic Spooler or its buffer, your computer may lock up. **Antic** has successfully tested Antic Spooler with BASIC programs as large as the 94-sector *WYSIWYG Cassette Jackets* (November 1987).

You can't turn BASIC on or off while Antic Spooler is printing, but you *can* do so afterwards.

Finally, you shouldn't use the DOS command because the DUP.SYS file might load right over Antic Spooler. If you enter DOS, Antic Spooler will abort its printing, reset all modified memory pointers and exit to DOS. When you return to BASIC, Antic Spooler will be unavailable. ■

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*Glenn Smith is a Mesa College senior at Grand Junction, Colorado and has been programming for five years. This is his first publication in **Antic**.*

FOR MORE ARTICLES LIKE THIS, CIRCLE 196 ON READER SERVICE CARD.

Listing on page 69

Online

By MATTHEW RATCLIFF

Choosing Your Modem

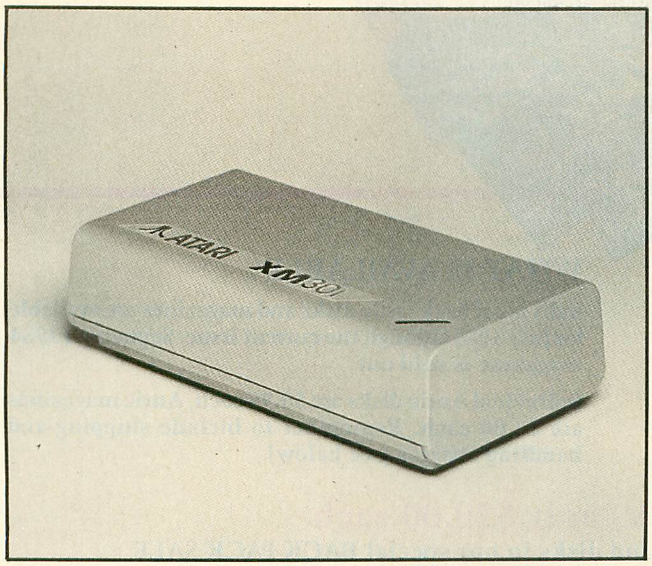
Strategy for online beginners

Your first significant investment before going online with your Atari will be a modem, the small box of electronic circuitry that actually interconnects your computer and the phone system.

You don't necessarily need to buy modem software when first getting started online. Usually you can acquire a good public domain terminal (or modem) program such as AMODEM 7.2 for the 8-bit Atari. And ST owners can start by using the VT-52 terminal emulator desk accessory that comes with their computers. Then after getting a bit of online experience, you'll have a better idea of what features you want to pay for in commercial modem software.

ATARI'S OWN MODEMS

Over the years, Atari Corp. has produced a series of widely used 300-baud modems that plug directly into the 8-bit Atari's non-standard SIO serial bus. You can still find either new or used XM301s, some older 1030 models, or



even a few ancient 835s. These are all "direct connect" modems, which means they plug directly into a modular phone jack.

Most standard modems require the computer to have an RS-232 serial interface. The Atari ST models have this RS-232 port built in. To connect RS-232 peripherals to your 8-bit Atari you will need the ICD P:R: Connection or the discontinued Atari 850 interface.

The Atari XM301 modem comes with good communications software, complete with XMODEM file transfer protocol. Keith Ledbetter, one of the best-known names among Atari modem enthusiasts, has written a 1030/XM301 version of his Express! terminal software. His latest revision is 3.0, available free from most bulletin boards. It is "share-ware" which you download, use, and send the author some money if you like his efforts.

AMODEM Plus, version 7.3, is the most recent version of this long-established public domain terminal program for the 8-bit Atari. Many different authors have made revisions to support the 1030/835/XM301 modems and these can be found on lots of Atari BBS libraries.

The older Atari modems are inexpensive—$50 or less—and save you the cost of a special interface if you don't already own a P:R: Connection or 850. But at a speed of 300 baud they are slow by today's standards. And their non-standard SIO connection means that they can be used *only* on the 8-bit Atari.

NEW ATARI SX212

Atari's newest online product is the SX212 modem ($99.95), which swiftly sold out its entire first shipment last Christmas. At 1200 baud, the SX212 is four times faster than the older Atari modems. This speed can save you a lot of online time costs when you transfer files over a long-distance BBS connection or a time-charge system such as CompuServe.

The SX212 has both SIO and RS232 interfaces, so it can connect directly to the 8-bit Atari or the ST. Or you can use a P:R: Connection or 850 to hook it up to the 8-bit.

The SX212 is Hayes compatible when it operates via

continued on page 30

PATRIOT 2400E MODEM

As modem prices continue to drop, combination 300/1200/2400 baud modems are fast becoming widely affordable. My **Patriot 2400E** is such a new model that my serial number is in the low 200s. The Patriot 2400E is a "Made in the USA" external smart modem made by Anchor. It comes with an external power supply, phone cord and input/output connector, owner's manual, two-year limited warranty, and subscription packages for CompuServe, The Source and GEnie worth up to $75. Owners of 8-bit Ataris will need an interface like ICD's P:R: Connection or the old Atari 850 to use the Patriot 2400E. However, ST owners can simply connect this modem to their RS-232 ports.

The Patriot 2400E utilizes the standard AT command set, which includes commands for controlling the internal "S" registers. You can modify operating parameters and store desired conditions in resident non-volatile memory, allowing automatic reconfiguration whenever you turn on the modem.

The modem circuitry is housed in an attractive tan and brown case with a speaker, volume control and a full complement of status lights. The speaker can be controlled with either the AT command or an external knob. The top panel reveals a set of DIP switches for making the modem work with your particular terminal program. I didn't have to change any DIP switches, but I did change one S register to make the modem work correctly with 850 Express!.

The modem supports U.S. and U.K. pulse dial timing, pulse and tone dial (even mixed pulse and tone), pause, wait for dial tone, wait for quiet answer, flash hook, stored number dialing, auto-answer, and autodial. Also included are English and numeric result codes that tell you what the modem is doing, and an Escape mode that lets you reconfigure the modem while online with another computer.

The 41-page owner's manual is comprehensive and thorough, and it includes a handy command reference sheet. The well-documented self-test operations make it easy to troubleshoot any problems. The only thing the manual lacks is a customer service phone number.

With prices that compete with the 1200 baud modems, plus many standard features, I highly recommend the Patriot 2400E.—GLENN SMITH

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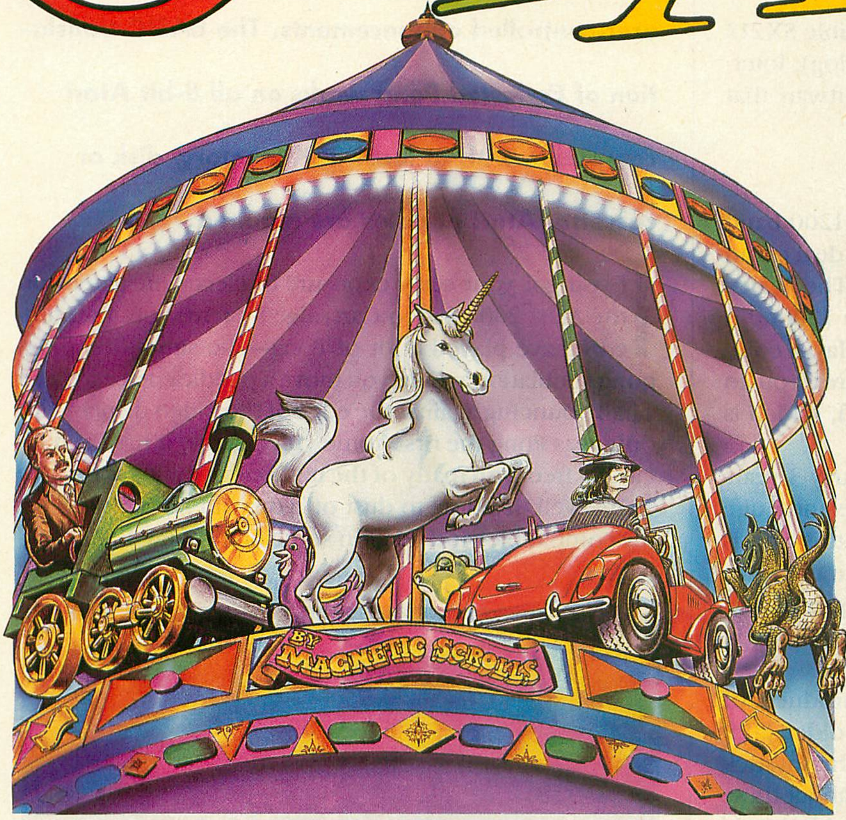
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CIRCLE **030** ON READER SERVICE CARD

CHOOSING YOUR MODEM
continued from page 27

the RS-232 interface. Hayes commands are the standard by which all modems are measured. You'd be hard-pressed to find a better Atari 8-bit online package than the SX212 modem with RS-232 interface and Keith Ledbetter's 850 Express!, version 3.0.

The only problem with the SX212 is that 8-bit owners who don't want to buy an RS-232 connector won't have any commercial software available until Atari comes out with its promised add-on package featuring a new SX212 version of Ledbetter's Express! software. I'll be reviewing this entire SX212 Express! system for **Antic** as soon as it becomes available.

ST owners will find that the Hayes compatible SX212 works very nicely with Flash (from The Catalog), Interlink, ST Term, ST Talk, or any other terminal software that supports Hayes compatible modems.

AVATEX, ANCHOR, SUPRA

Avatex makes a popular line of low-priced 1200 baud standard modems. If you come across a good deal on an Avatex, take careful note of the model name. The Avatex 1200 is a good general-purpose unit, but the 1200hc is preferable because the "hc" stands for fully Hayes compatible. The basic Avatex 1200 model requires you to switch manually between 300 and 1200 baud, which is not acceptable for running a BBS.

I've been using an Anchor Mark XII for nearly 3 years without any problems. It is extremely reliable and quite Hayes compatible. My only complaint about this unit is that it doesn't have a built-in speaker. I like to use a modem speaker to listen to the sound of telephone signal tones. The current crop of Anchor modems, including their new Lightning 2400 baud series, all have speakers.

Supra, formerly MPP, has been a longtime producer of modems for the Atari. If you run across an older MPP modem that connects to the 8-bit Atari via the joystick port, I have heard a fair number of complaints about these discontinued models. (*We were quite happy with the old MPP we used at **Antic** for several years.*—ANTIC ED) But the newer Supra 1200 and 2400 baud modems are quite good and come at good prices.

2400-BAUD SPEEDSTERS

If you truly have "the need for speed" online, shop for a good 2400 baud modem. Prices are coming down to the $200 range. But I suggest avoiding mail order house brands because you don't know what you're getting and the quality can be uneven. I bought such a modem and it decided to hang up the phone every time my air conditioner kicked on. I didn't get my refund until after several months and about six long-distance phone calls.

Good, low cost "brand names" you can generally trust are US Robotics, Everex, Avatex, Supra and Anchor. If you come across a bargain brand you're not familiar with, find someone who owns one and has first-hand experience with it. ■

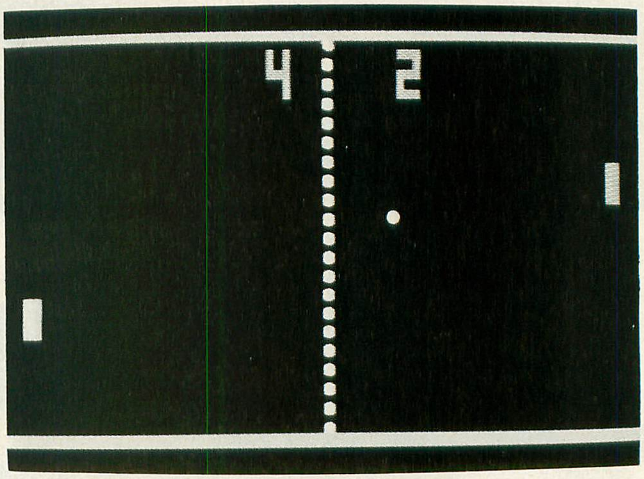
By BOB AYIK

Perfected Pong

New challenges from an old favorite

This short machine-language update of the very first Atari video game is jammed with powerful user-controlled enhancements. The BASIC *translation* of Perfected Pong works on all 8-bit Atari computers with at least 32K memory, disk or cassette. Atari paddles are required.

If you got your early exposure to electronic games on the Atari 2600 Video Cartridge System, you undoubtedly have played a lot of Pong—the simplified ping-pong simulation where you move a paddle cursor to keep a ball bouncing against the edge of the video display. Not only was Pong the first home video game, it has been included free with many of the millions of 2600s sold since 1977. Well, it's time to dust off your old Atari paddle set (or compatible) and take on some brand-new Pong challenges.



I began writing Perfected Pong after playing the classic game with 8-year-old Laura. We were playing at slow speed and she was killing me. But she wasn't having fun. She kept claiming that I was letting her win.

Now Laura beams as she wins, because Perfected Pong has six different skill levels that can be set independently for each player. Every skill level has a different starting and maximum ball speed.

Perfected Pong also has 20 different angles of ball rebound, which gives you a lot of subtlety in controlling

how the ball spins off your paddle.

You can master Perfected Pong in practice mode, where one or two players volley without any scorekeeping and the ball bounces right back into play after "falling off" the end of the screen. Just tap any key and the ball will slow down to its beginning speed for that level.

There are also some nice new audio-visual touches. Players can select any of 16 possible color combinations for the screen. I used 16-bit sound channeling to create the familiar click of the ball hitting the boundaries. There is also a new twangy sound for the ball hitting the paddles.

When a point is tallied, the score pulsates as it changes. And while waiting for a serve, a pulsation also marks the paddle of the player who is to serve next.

Perfected Pong is a short (about 3.5K) update of Pong. It's written in fast, smooth MAC/65 assembly language.

GETTING STARTED

PONG is a machine language program which would be difficult to type in original form. Listing 1, MAKEPONG.BAS, is an easy-to-type BASIC program that creates this machine language program for you.

Type in Listing 1, check it with TYPO II and SAVE a copy before you RUN it. When RUN, Listing 1 creates the machine language game for you, and writes it to a disk file called PONG.EXE. Antic Disk Owners will find PONG.EXE on this month's disk.

There are two ways to start the PONG program. Method 1: Type DOS, after making sure you're using DOS 2 or DOS 2.5. When the DOS menu appears, type L [RETURN] then type PONG.EXE [RETURN].

Method 2 will give you automatic loading: Format a blank disk, using DOS 2 or DOS 2.5. Next, type H [RETURN] to WRITE DOS FILES TO DISK. Now use DOS option C to copy PONG.EXE to this disk. Finally rename PONG.EXE to AUTORUN.SYS.

By now, you should have three files on your disk: DOS.SYS, DUP.SYS and AUTORUN.SYS. To play Pong, remove all cartridges from your computer, put this disk into drive 1, (XL/XE owners should hold down the [OPTION] key) and turn on your Atari. PONG will automatically load and begin.

The first thing you'll see when you play Perfected Pong is a flashy title screen that lists the keys to press for selecting game options. You can quit a game anytime and return to the title screen by pressing [CONTROL] [Q]. When you complete a game, press either paddle button to start a new game at the current settings, or press any key to return to the title screen. ■

Bob Ayik of Maple Shade, New Jersey is an attorney practicing in the Philadelphia area. Perfected Pong is his first publication in **Antic**.

FOR MORE ARTICLES LIKE THIS, CIRCLE **192** ON READER SERVICE CARD.

Listing on page 67

By BARRY KOLBE

Recall

BASIC Concentration 8-bit memory game

Recall is a flashy new 8-bit Atari BASIC version of the classic televison game, Concentration. (An ST Concentration game appeared in last month's Antic.) This fast, smooth BASIC program runs on Atari 8-bit computers with minimum 48K memory, disk or cassette.

"How has your memory been lately?"
"Ah. . . ah. . . I forget."
"You might try playing Recall on your 8-bit Atari. . ."

Pit your memory against a human or computer opponent with Recall, a colorful new 8-bit BASIC adaptation of TV's classic Concentration game. The Recall game board consists of 30 numbered positions with an object hidden behind each one. A player chooses two numbers, exposing both object icons. If there is a matching pair, two characters of a hidden message replace the objects. You have earned a point and can take another turn. If you fail to make a match, it's your opponent's turn.

As **Antic** explained in last month's *GFA BASIC Concentration* for ST computers, the game is won when the complete message is guessed correctly, or fully displayed after the final successful pairing. You make a guess at the beginning of a turn by pressing [CONTROL] [G] and if you're right, you get all the remaining points.

USING THE PROGRAM

To get started, type in Listing 1, RECALL.BAS, check it with TYPO II and SAVE a copy before you RUN it. If you have trouble typing in the special characters in lines 1650, 1680, 1720 and 1760, don't type them. Instead, type in Listing 2, check it with TYPO II and SAVE a copy. When you RUN Listing 2, it creates these hard-to-type lines and stores them in a file called LINES.LST.



To merge the two programs, disk users LOAD "D:RECALL.BAS" and then ENTER "D:LINES.LST". Cassette users: CLOAD Listing 1, then insert the separate cassette used for Listing 2 and ENTER "C:". Remember to SAVE the completed program before you RUN it.

Plug a joystick into port 1. In a two-player game, plug another one into port 2. When the game starts, press [SELECT] to choose between a one-player or two-player game. Press [START] to begin playing. In a one-player game, your computer opponent has an infallible memory, so watch out. But just to even the odds a little, your Atari makes the first move.

Recall comes with 10 messages starting at line 1900. These are randomly selected by the computer. You can change these or add to the list. Just make sure that the line numbers start at 1900 and are 10 apart. Also, change the variable I in line 1850 to reflect the number of statements you have. All messages must have fewer than 31 letters and you should avoid punctuation marks.

Now let's see. Was the boat under number 12, or was it 17? Or was the ring under 17 and the boat under 27?■

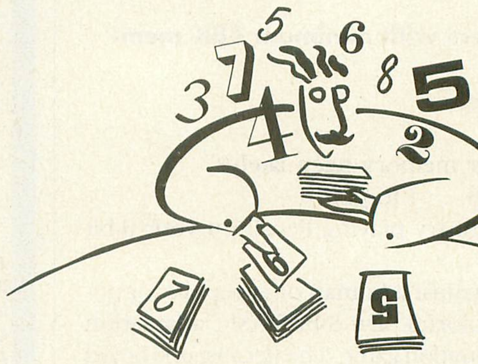
Barry Kolbe is a high school math teacher in Madison, Wisconsin and enjoys solving all kinds of puzzles. He co-wrote Antic Spelling Checker, *the October 1987 Super Disk Bonus.*

FOR MORE ARTICLES LIKE THIS, CIRCLE 194 ON READER SERVICE CARD.

Listing on page 70

Super Sorters

Part II: Mixed Numbers Sorting Routine



By KEVIN PECK

Why won't all your ASCII text sort routines work with numbers in strings? The problem is that normal sort routines look at data one character at a time. As soon as the routine finds two unequal characters, it thinks it's done searching and decides whether or not to swap the two data elements, depending on the sort order. This is fine for text, but simply does not work with numbers.

Let's look at an example using a character-by-character sort on the names SMITH and JONES. The computer finds that the ASCII value of S is greater than J. Thus Smith is greater than Jones—so the two last names must be swapped. This works as expected. We don't care about the rest of the text field. We know a swap is necessary after examining just the first character in each data element.

With the numbers 24 and 156, if we go character by character, the computer will first decide that since 1 is less than 2, then 156 must be less than 24. Oops! We need another sorting method that looks at the whole number first before sorting character by character.

My Mixed Numbers sort routine first determines the signs of the two numbers. If they're not equal—one is positive and one is negative—then we don't even have to look at the rest of the number.

This concludes a two-part series of powerful sorting routines for intermediate programmers, which began with Multikey Sort in the April 1988 issue. Mixed Numbers is a machine language routine that sorts strings containing mixed numeric data types—positive numbers, negative numbers and floating decimal point numbers. Also included is a general-purpose substring finder routine that does multikey sorts within the Mixed Number sorter. This BASIC program works on all 8-bit Atari computers of any memory size, with disk or cassette.

We can decide right away if we need to swap them. If the signs of the two numbers are equal, then we move to the next test.

The second test involves finding the lengths of the two numbers. We'll examine each number, character by character, until we find a decimal point or a space. We do this because 1.2345 is less than 45, although 1.2345 has more digits. Using this method, 1.2345 has a length of 1, and 45 has a length of 2. If the two lengths are unequal, then we can decide right now whether or not to swap them. Otherwise, we must go to the third step.

Our third step goes back to looking at the two numbers on a character-by-character basis. This only works for numbers of equal lengths—the only kind we'll have if we make it this deep into the testing. But what if they're the same length before the decimal point but have a different number of digits after?

According to part two of the test, the numbers 34.567 and 34.5 both have a length of 2. The character-by-character comparison will take care of problem with the digits after the decimal point.

The computer will find the first four characters of each number to be equal. When it gets to the fifth character it will find a 6 in the first number and a space for the second. According to the computer's internal table, the value of a space is less than the value of any number so the computer will correctly decide that 34.5 is less than 34.567.

The only problem with this three-prong numeric sort arises when you have two negative numbers. While 45 is greater than 38, -45 is less than -38. Mixed Numbers checks to see if it's sorting two negative numbers, and if so, it reverses its swap decision.

GETTING STARTED

Type in Listing 1, NUMSORT.DEM, check it with TYPO II and SAVE a copy before you RUN it. If you have trouble typing in the special characters in lines 2010-2100, don't type them in. Listing 2 will create them for you. Type Listing 2, checking it with TYPO II, and SAVE a copy to disk. When RUN, Listing 2 creates these hard-to-type lines, and stores them in a file called LINES.LST.

To merge the two programs, disk users LOAD "D:NUMSORT.DEM" and then ENTER "D:LINES.LST." Cassette users: CLOAD Listing 1, then insert the separate cassette used for Listing 2 and ENTER "C:".

Finally, remember to SAVE the completed program before you RUN it. You should also keep a copy of LINES.LST, the machine language sort routines, for use in your own BASIC programs.

HOW TO USE THEM

Here is the proper format for using this routine in your own BASIC programs:

A=USR(ADR(SN$), FIRST, LAST, FIELDLEN, OFFSET, RECLEN, ORDER)

And here is an explanation of each part of the statement:

A: A USR call may return one value to your BASIC program. That value is sent here. BASIC demands that *all* USR calls be written this way, even if no value is returned.

ADR(SN$): Address of the string containing the sort routine. This string appears in lines 2030-2100 of the demo program.

FIRST: Memory address where we will start the sort. It will always be greater than or equal to the address or the string containing the sorted data.

LAST: Address where the sort ends. It must be greater than FIRST, or the computer will lock up.

FIELDLEN: Length of the numeric field we'll be sorting on. The data string must be put in fixed-length record format. This means that extra characters in the numeric field must be padded with spaces for the routine to work properly.

OFFSET: Amount of character spaces into the record where the numeric field starts.

RECLEN: Length of each record within the data string.

ORDER: Sort order. Use 0 for an ascending sort, or 1 (or any non-zero value) for a descending sort.

continued on next page

DEMO

The demo program uses string DS$ set up as shown below:

Figure 1

Last Name	First Name	Income	Tax Owed
7	6	8	7

Record Length = 28

Line 1070 in your completed demo program enters the subroutine to set up the two machine language strings.

Lines 1120-1200 read the sample data from lines 1590-1780 into one big string, padding any missing characters with spaces.

Then the string is printed as is, using the routine starting at line 1470. The bottom of the screen will tell you that you are now viewing the raw, unsorted data. Press the [SPACEBAR] to continue.

Now we'll actually sort some data. First we'll do an ascending sort by income. This is done in line 1230: ADR(SN$) is the address of the machine language string, ADR(DS$) is the address of our data string, and ADR(DS$)+LEN(DS$) is the ending address of the string in memory.

The income field length is 8. And 13 is the "offset" from the start of the record to the sort field. The offset is obtained by adding the lengths of all fields *before* the field you're manipulating—as explained last month in *Super-Sorts: Part I.*

Both last name (length = 7) and first name (length = 6) appear before income. Since the sum is 13, the offset of income is 13. *Figure 1* gives us the record length. Finally, let's do an ascending sort, giving ORDER a value of 0.

Line 1240 displays the new sorted information, tells you the current format and waits for you to press the [SPACEBAR] again.

Line 1250 sorts the data string again, but by tax owed this time—in descending order. The 8 in line 1230 is changed to a 7, so the length of the sort field is now 7 characters. The offset is changed from 13 to 21. The new format is printed to the screen in line 1260.

SORTING TECHNIQUES

I've found that I usually sort the database by a normal string field and then sort numeric data within smaller sections. For example, let's use a database containing all of our programs, the language they're written in, and their length in bytes so we know how much memory we need for each.

Let's sort them by language first: BASIC, ACTION!, Logo, etc. Then let's sort the programs by memory length within each language. My Multikey sort routine won't work because of the numeric memory length field. We need the starting and ending address of each language within the main data string so we can properly sort the memory length.

The second machine language subroutine is stored in FS$. It finds the first and last occurrence of a field within your data string, then it returns the actual address of these items, which lets you pass the values to the numeric sort routine—which requires a little more work to use it properly.

This is the format of the routine:

START=USR(ADR(FS$), ADR(D$), ADR(FLD$), LENFIELD, OFFSET, LENRECORD, RECCNT)

LAST=PEEK(205)+256*PEEK(206)

I used the variable START instead of A=USR(. . .) because the routine is passing information back to us this time. In this case, it's returning the address of the first element in the sort.

Note that START will equal zero (0) if the field string is not found within the main data string. Be sure to check START for a 0 value before calling the sorting routine. Otherwise, if START is equal to 0, the computer will attempt to sort Page 0 memory and lock up.

You should also check to see if START+RECORD LENGTH is equal to LAST. If so, then only one record containing the given field string was found. And sorting one field will get you nowhere. The second line retrieves the second bit of information supplied by the routine.

Here are the variables:

ADR(FS$): Address of the machine language routine.

ADR(D$): Starting address of the data to be searched.

ADR(FLD$): Address of the string containing the field information we're looking for.

LENFIELD: Length of the field we're looking for. This should be set to LEN(FLD$) for the routine to work properly.

OFFSET: Number of character spaces into the record where the field starts.

LENRECORD: Length of each record within the data string.

RECCNT: record count—the number of records to search within the main data string. To search the whole data string, this will be set to LEN(D$)/LENRECORD. You could sort a subset of the main data string by passing a value between 2 and the actual record count.

The demo program uses the String Find routine in line 1560. We'll use a data string with a fixed record length, using two fields: field one is the programming language and field two is the memory length in bytes:

Figure 2

Program Language	8
Length in Bytes	3
RECORD LENGTH	11

The routine is called several times, starting in line 1370. We must first tell the routine what language to look for by storing the language name in I$ before calling the rou-

continued on page 38

Poland To USA Via Antic I/O

The most unusual story we have ever published

By TADEUSZ MENERT

I don't know how many **Antic** readers will remember my letter published in the April, 1986 I/O Board under the title "Poland Teacher." It was a request for readers to send any Atari-related materials for use with my students at the University of Krakow. I explained that few Poles had Atari computers and that software was even scarcer than the small quantities of basic food products reaching this distant and quite different country—where money cannot be exchanged for any Western currency.

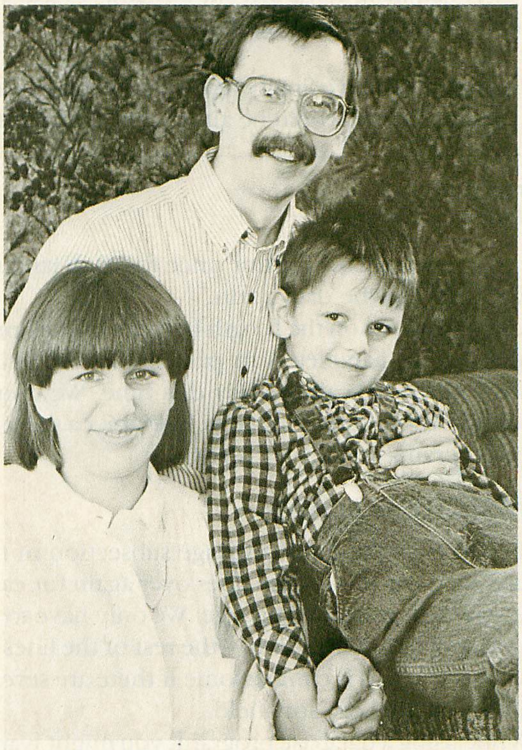
Within weeks after publishing my message, I was almost drowning in the wave of letters, magazines and disks. Dozens of people who never met me were suddenly offering to pay the subscription fees to various computer magazines so that I could receive them directly in Poland.

It is said that extensive users of impersonalized computers are deprived of warm feelings. On the contrary, these supposedly heartless computer monsters actually appeared to be much more friendly and understanding than others who never touch a computer keyboard. It seems that the popularity of personal computers creates a network of friendly users willing to share their concepts and knowledge no matter where they live or what they do.

In June 1986, two months after my letter appeared in **Antic**, I was forced to leave Poland due to various political reasons. I had to leave behind my Atari, along with almost all my belongings. With my wife and our four-year-old son, Mike, I landed in West Germany.

It seemed quite natural to try to get to an English-speaking country. I was, after all, an English teacher. The United States was our choice. However, according to cur-

continued on next page



Tadeusz and Jolanta Menert with their five-year-old son Michal.

POLAND TO USA VIA ANTIC I/O
continued from previous page

rent immigration laws, being a political refugee isn't enough for admittance to the USA. Sponsors are needed who will help a refugee settle down succesfully.

With no relatives in America and only a few pen-pal Atarians, it seemed almost impossible for us. Besides, deprived of my 800XL and disk drive I could no longer count on writing interesting letters, full of computer news and gossip, to the States.

Although I never openly asked any of my friends for help in getting across the Atlantic, they offered such help on their own! By September 1986, we already had our sponsor, Marlin. But there were still long months of waiting while our paperwork was processed by the American immigration authorities.

Having quite a lot of time at my disposal, I looked around to see how well the Atari was doing in West Germany, since I had read so many positive things about the growing Atarian population there. However, it was hard to find a single active users group. It was somewhat sad to see that other computers had so many active users groups holding regular meetings, advertising in local papers, organizing computer shows. And I found only one or two Atari-specific magazines—they were exclusively for the ST.

In August 1987 we finally received the long-awaited letter saying that we would be allowed to come and live in the United States of America. Less than a month later, we landed happily in Colorado, heartily welcomed by people we had never seen before in our lives. When they decided to help us the year before, the only thing they knew about us was that we needed help. Thanks to them, we were able to start our new life on the American soil.

But some thanks also must go to that little magic box called a computer. I am often asked how it happened that we ended our long journey in Colorado. Before giving any more detailed answer, I always reply "Thanks to Atari!" and I watch the confused looks.

When you are starting life over again from the very beginning, there are many important things to take care of. But although it will definitely be some time before we can afford to buy a computer, I know what make I will choose when the time comes. I owe you too much, Atari, to trade you for something else!

P.S. I would like to assure everyone who sent Atari materials to Poland in answer to my 1986 I/O letter that it is still being used by my friends living there. This has been a great support to those needing helpful information that would otherwise be unavailable in Poland. Thank you once again. ■

Tadeusz Menert, former English professor and present janitor, still welcomes any letters from Atarians willing to write to him at: 4040 S. Garfield Avenue, Loveland, Colorado 80537.

SUPER SORTERS
continued from page 36

tine. We must call the routine once for each language before displaying the data again.

Line 1420 sorts on the Length In Bytes of each program. Notice that the parameters are passed from the String Find routine when we call the sort this time. We don't want to sort the entire data string here, but rather a subsection—only programs written in BASIC.

SUBSECTION SORTS

To sort each program language subsection of the data string, we'd use these same lines over again for each possible value of program language. We only have to change the value of FLD$ each time—the rest of the lines remain the same. But this is cumbersome if there are several possibilities for the key sort field.

While using a database program, you might want to examine a subsection of the database. Using the program language database example again, let's say you want to see all Logo programs, with their memory length in bytes. If you've sorted the string by program language using the Multikey Sort routine, then a quick call to the String Find routine will supply the addresses necessary to display the requested information. Here's another example:

```
200 FLD$="LOGO"
210 FIRST=USR(ADR(FS$), ADR(D$), ADR(FL$), LEN(FLD$), 0, 15, LEN(D$)/15)
220 IF FIRST=0 THEN PRINT "No matching data found.":GOTO 300
230 FOR I=FIRST-ADR(D$)+1 TO LAST-ADR(D$) STEP 11
240 PRINT D$(I,I+10):NEXT I
250 REM Program continues here
```

These program lines would display all Logo programs and their memory lengths.

You could also use the String Find routine to make sure that you haven't entered any duplicate data. Some database applications don't let you duplicate certain fields. If you enter "Paper Clips" while in the Add Category function of an inventory database, the program must check to see if that category already exists. If so, then the program must tell you so and instruct you to enter the Adjust Inventory mode to add the newly purchased paper clips to the database.

To test for duplication, enter the new field data and use that data as the FLD$ parameter for the String Find routine. If START=0 after calling the routine, then the program can add the new information to the list. Otherwise the program should warn the user of the duplication and let you exit from the Add Category routine. ■

Kevin Peck wrote the Word Searcher *puzzle solver (**Antic**, March 1987) as well as* Super Sorter: Part I *(April 1988). He is a computer science major from Salina, Kansas.*

Listing on page 69

The Ever-Changing Atari Marketplace

Six Antic Years

By NAT FRIEDLAND, *Antic Editor*

WELCOME, XE-GS OWNERS

Atari Corp. sold 100,000 XE Game Systems in the U.S. last Christmas—every unit that they manufactured last year. And of course the XE Game System is just a cosmetically redesigned 800XL/65XE 8-bit computer.

True, the XE Game System is being marketed as a device for playing entertainment software cartridges without needing a disk drive. But it seems very likely that after a few months with challenging "games" like the Flight Simulator II cartridge included with the XE Game System, many new owners will become full-fledged Atari users by adding the advanced new Atari XF551 drive ($199.95) which is now available.

Thousands of XE Game System owners probably will soon want to explore more of the outstanding capabilities of the 8-bit Atari. They might first try large-scale graphic adventure game disks that need saving between play sessions. From there, it's an easy step to using paint programs, word processors, databases, speech products—and the many fine programs available from users groups, online and on Antic Disks.

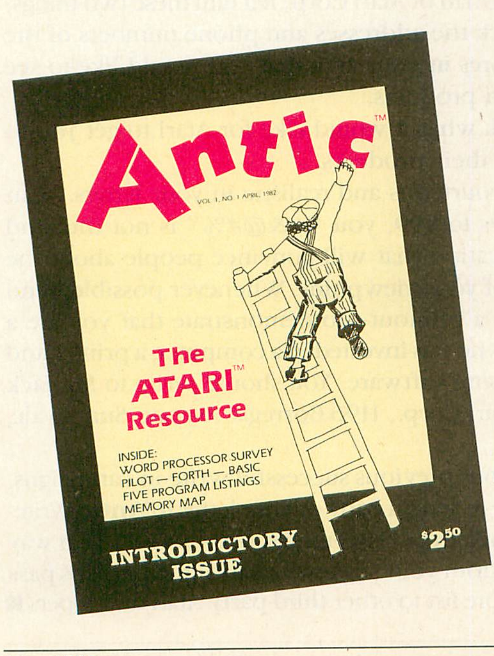
Meanwhile, the first big batch of Atari entertainment cartridges for the XE Game System is being shipped (and will be reviewed in the next issue of **Antic**). These cartridges can be used on *any* Atari 8-bit computer. The 12 impressive titles feature classic software that has either *never* been available for the 8-bit Atari or has long been unavailable—Battle Zone, Blue Max, David's Midnight Magic, One-on-One Basketball, etc. Naturally, **Antic** will review all new Atari cartridges as soon as they become available.

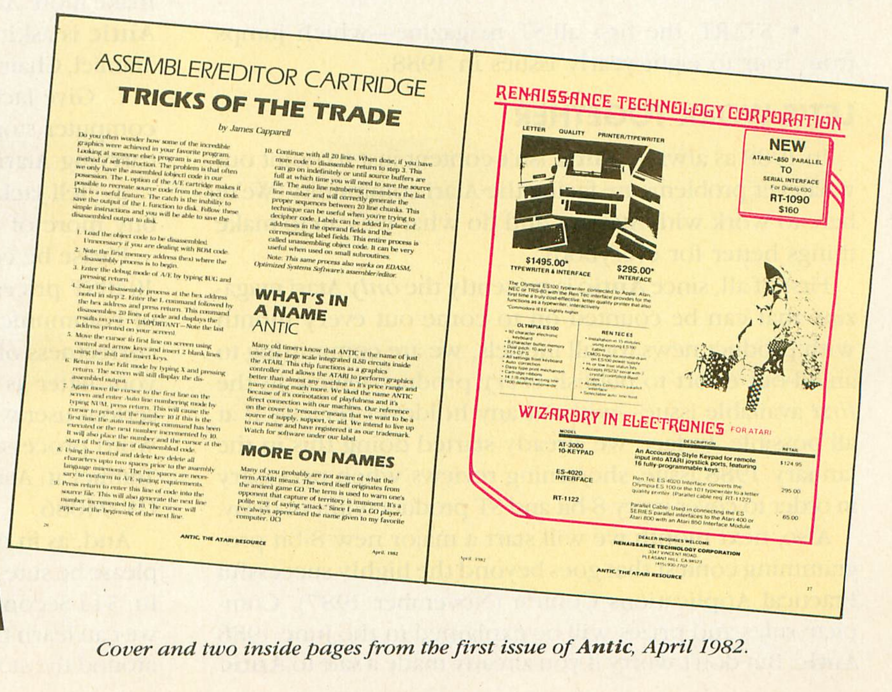
CONSTANT CHANGE

Considering that Atari personal computers have always been a comparatively specialized segment of the overall computer market, **Antic** has certainly seen many dramatic Atari changes during our first six years of publication. When publisher James Capparell put out our first issue in April 1982, an Atari 800 with 16K memory and a bulky 810 disk drive cost $1,679.95.

Then as now, **Antic** had no doubts that the Atari was technologically the best 8-bit computer ever made. But it took an adventurous and individualistic computer user to recognize this. The old Atari, Inc. owned by Warner Communications never marketed their great computers effectively. At first the company was too busy making unprecedented amounts of money on video cartridge systems—peaking at $2 billion sales in 1982, the year of Pac Man. Then when the bottom dropped out of the video game market in 1983, shell-shocked executives were too

continued on next page





Cover and two inside pages from the first issue of ***Antic****, April 1982.*

busy trying to halt a $450 million loss!

A totally unexpected bombshell hit the Atari world in July 1984 as Warner sold the company for $240 million to Jack Tramiel, the man who built Commodore Computers (especially the Commodore 64) into Atari's victorious arch-rival in the marketplace. The feisty, aggressive Tramiel swiftly finished restructuring the company into a lean-and-mean competitor, changing its name to the Atari Corp.

In an astonishing six months, the new Atari Corp. premiered the groundbreaking 520ST computer at the January 1985 Consumer Electronics Show, and then brought it to market by June. Without question, this was a unique, even heroic, feat that won Atari renewed worldwide credibility. In November 1986, Atari Corp. went public with a sold-out $50.6 million stock issue. And the price of Atari shares more than doubled before falling back as a result of the October 1987 stock market slump.

ATARI COMMUNITY '88

Antic Magazine is proud to have completed six years of service to the worldwide Atari community. The unique loyalty of Atari-using **Antic** readers enabled Antic Publishing Inc. to grow from classic "kitchen table" beginnings to a 54-employee company occupying an entire three-floor San Francisco building.

The success of **Antic** Magazine is what made it possible for us to bring Atarians these other important services:

• ANTIC ONLINE, our pioneering three-year-old electronic publication on CompuServe that provides the fastest Atari news, software and graphics files for downloading, and a vast archive of reviews and articles.

• ANTIC SOFTWARE, probably the leading supplier of high-quality programming for all models of Atari computers, featuring 8-bit software like RAMbrandt and ST products like CAD-3D and the Cyber series.

• START, the first all-ST magazine—which jumps from four to eight yearly issues in 1988.

LET'S WORK TOGETHER

In 1988 as always, **Antic** isn't content just to point out whatever problems are facing the Atari community. We're here to work with Atarians and do what we can to make things better for everybody.

First of all, since **Antic** is presently the *only* Atari magazine that can be counted on to come out every month with product news for all models, we are committing to an all-out effort to publish *every* product review in the *first* available issue—without any holdover reviews if at all possible. In fact, we already started doing this in the January 1988 issue, shortening reviews when necessary in order to cover every 8-bit and ST product without delay.

Also, next month we will start a major new 8-bit programming contest that goes beyond the highly successful Practical Applications Contest (November 1987). Complete rules and prizes will be explained in the June 1988 **Antic**. But don't worry if you already made a sale to **Antic** this year, all programs accepted for publication during 1988 will automatically be considered for the contest.

The editors of **Antic** believe most Atari users would agree that the biggest problem facing Atarians today is the difficulty of finding software and other products for our computers. Product unavailability is especially severe for the 8-bit Atari, but the ST situation could use considerable improvement too.

Unfortunately, this problem is too big for **Antic** to fix by itself. But if enough users are willing to become just a bit more involved, we think that genuine progress could be made! After all, a pre-release copy of Springboard's new 8-bit Atari version of Newsroom just arrived at **Antic**—a product that would never have been created if it wasn't for the hundreds of readers who responded to **Antic's** 1987 write-in campaign.

If you'd like to find more Atari products at convenient dealers, here are few simple things you can do: TELL your nearby software dealer that you want to buy products for your Atari there. JOIN your local users group. SUPPORT Atari software publishers by buying the programs you want—DON'T trade illegal copies with your friends!

And if you want **Antic** to continue coming out every month with the best coverage supporting *your* Atari computer—please give this magazine the support it needs from you! SUBSCRIBE—that's the most important thing you can do to keep **Antic** at its best for you! Also, submit good articles, programs, reviews and tips. Don't be shy about it. Remember, **Antic** has always been written primarily by its readers. Right now, we can use more reviewers with all kinds of special backgrounds—from ST sysops to 8-bit hardware upgraders. So write to **Antic** and tell us about your areas of expertise.

WRITE TO UNCLE JACK

Now let's get together for a special project that could make more Atarian products available in *your* area soon! **Antic** is asking you to write a letter this month to Jack Tramiel, Chairman of Atari Corp. Tell him these two things:

1. Give Jack the addresses and phone numbers of the computer stores in your area that you would like to see carrying Atari products.
2. Tell Jack what it would take for Atari to get *you* to buy more of their products.

Please be courteous and realistic in your letters. "Cut 1040ST prices to $99, you *+&@#%" is not the kind of communication that will convince people about the correctness of your viewpoint. Whenever possible, send your letter as a printout—to demonstrate that you are a serious user who has invested in a computer, a printer and word processing software. You should write to Mr. Jack Tramiel at: Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086.

And, as in our previous successful write-in campaigns, please be sure to send a copy of your letter to **Antic** Write-In, 544 Second Street, San Francisco, CA 94107. That way we can learn from your suggestions too, and perhaps pass around the store list to other third-party Atari developers.■

Third Annual

ANTIC AWARDS

Outstanding Atarian Achievements of 1987-88

This issue's Third Annual Antic Awards show there is a wide spectrum of large and small companies, individuals and clubs providing outstanding support for the Atari Community.

This year, Antic is pleased to honor some 18 Outstanding Atarian Achievements, more than ever before. As we decided in 1987, no winners are eligible for an award in two consecutive years. There are many other deserving Atari contributors whom we expect to honor in future anniversary issues. With the help of loyal, dedicated Atari users, Antic Magazine looks forward to meeting the ever-changing needs of the Atari Community for many more years to come.

Outstanding

Products

BBS

Users Group

Services

Professional Programmer

Antic Contributor

By GREGG PEARLMAN, Antic Assistant Editor

James Pierson-Perry

Outstanding Antic Contributor



Having appeared in every **Antic** but two since March, 1987, Jim Pierson-Perry is undoubtedly our most prolific Contributing Writer these days—as well as the most versatile contributor. A research chemist for Dupont, Jim writes programs and reviews products on both the 8-bit and ST computers. His expertise includes music and MIDI software, scientific and financial applications and adventure games. Jim's *Designer Labels* program (April, 1987) made it possible to put Print Shop icons on stick-on labels and was just about the most popular **Antic** program last year.

Publishing Partner

Outstanding Product

SoftLogik's **Publishing Partner** desktop publishing program, is one of the most ambitious packages being marketed for the ST. It is GEM-based and easy to use, and putting DEGAS or NEOchrome pictures into your text is no problem. To date, Publishing Partner is the most popular ST desktop publishing software around. It was written entirely in 68000 assembly language by Deron Kazmaier, whose new **Publishing Partner Professional** upgrade is due shortly with even more powerful features.



GFA BASIC

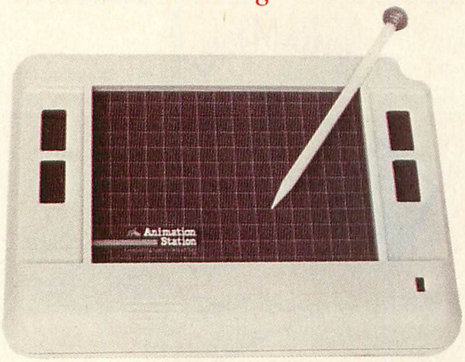
Outstanding Product

Quick, memory-efficient **GFA BASIC** is the best BASIC programming language available for the Atari ST. Its main drawback is that unlike ST BASIC, you don't get a free copy of GFA BASIC when you purchase your computer. But users have been able to overlook this inconvenience, since GFA BASIC costs just $79.95 and supports many GEM functions by keyword. Most **Antic** ST programs are now written in GFA BASIC, a German import distributed in the U.S. by MichTron. GFA BASIC boasts a rapidly increasing number of support products, including a compiler for standalone machine language code.

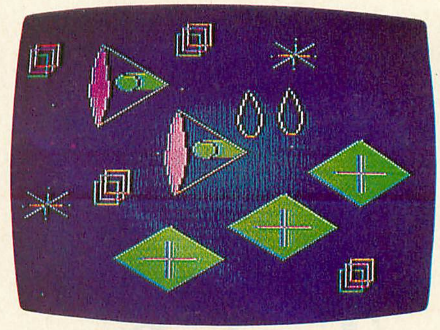
ANTIC AWARDS

Animation Station

Outstanding Product



Suncom's **Animation Station**, reviewed in the November 1987 **Antic**, consists of a sturdy, well-designed graphics tablet and Baudville's DesignLab paint program. Suncom, best known in the Atari market for their joysticks, is doing a fine job filling the void left when the KoalaPad and Atari Touch Tablet were no longer being made.



Virtuoso

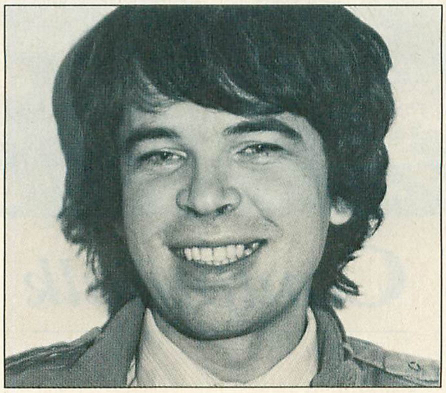
Outstanding Product

Virtuoso Desktop Performance Studio (April, 1988) brings true desktop video to the 8-bit Atari XL and XE. Virtuoso is a unique music/graphics interface that enables experienced users to create impressive animations with soundtracks—in real time.

This is the kind of dramatically innovative software that gives the 8-bit Atari its best chance of staying viable. The brainchild of Joseph Lyons and Frank Schwartz, Virtuoso can be used for many other applications. A marine navigational plotting adaptation has already been licensed.

Boris Tsikanovsky

Outstanding Professional Programmer

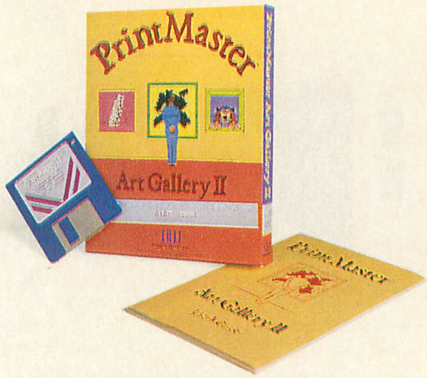


The ST has always had 512 colors, but until **Spectrum 512**, you could use only 16 at a time. Boris Tsikanovsky has changed all that and then some—Spectrum 512 uses "dithering" techniques to simulate not just 512 colors, but *24,389*. In Spectrum 512 you can use DEGAS and NEOchrome pictures or convert Amiga .IFF and CompuServe GIF files.

Two recent additions by Boris give Spectrum 512 even more flexibility. **Digispec** lets you convert *any* Amiga picture—even a 4,096-color image. **Unispec** turns Spectrum 512 into a desk accessory so, for example, you can grab a chunk of your picture while in DEGAS and paste it onto the current 512-color picture.

PrintMaster Series

Outstanding Product



TurboBase

Outstanding Product

MicroMiser's **TurboBase** (**Antic**, December 1987) is a high-powered business software package that rivals the integrated applications available for IBM PC and works on 8-bit Atari systems costing a fraction of the PC price. Turbobase sets up customer directories, dated records, inventory, invoices, payroll and more. The program can take advantage of just about every hardware enhancement available for the 8-bit Atari, such as the 1Mb RAMdisk capability of ICD's Multi I/O Board and SpartaDOS 3.2.

This continuing series of graphics/text page printing programs from Unison World works like a highly advanced ST version of the 8-bit Atari's classic Print Shop software. But **PrintMaster** uses the ST's power to support much sharper graphic images and a much greater variety of printers. The series currently includes PrintMaster and PrintMaster Plus, as well as Fonts & Borders and PrintMaster Art Gallery I and II.



CompuTalk

Outstanding BBS

Take six 48K Atari 800s, each with a modem and an 850 interface, link them all together via a 20Mb Corvus Hard Disk and Multiplexer. Now toss in 25-year-old sysop Kris Meier and you have **CompuTalk** of Ft. Worth, Texas, possibly the largest Atari bulletin board system operated by a private individual. Meier said that before the article "Texas-Sized BBS" in the August, 1987 issue of **Antic**, his BBS received around 100 calls a day. But now that more Atari users know about it, that number has increased to 230—and 80% of Meier's callers read about CompuTalk in **Antic**.

PCS School

Outstanding Service



At Patrick McShane's **PCS School** in Nampa, Idaho, students ranging from first grade through 12th use Atari computers to push to the limits of CAMLU—Computer Activated Motorized Lego Unit. Among the Atari-controlled Lego equipment they've developed are a plotter and a hoist that lifts upwards of 40 pounds with a 4-volt motor.

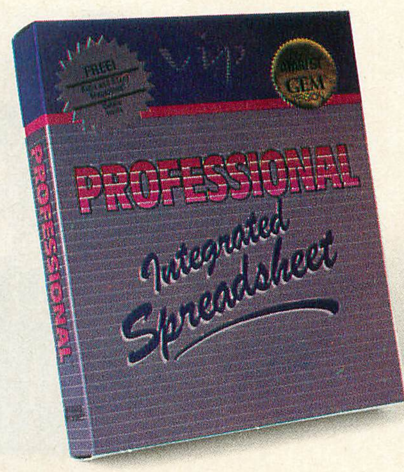
Since the publication of *Maverick Atari School* in the October 1987 **Antic**, McShane's enrollment has more than doubled, and students attend from all parts of the country. "We've even heard from people from behind the Iron Curtain," says McShane.

CLAUG

Outstanding Users Group

Since 1985, volunteers from CLAUG (ChicagoLand Atari Users Group) have been a mainstay in helping staff the Atari Corp. booth at the Summer Consumer Electronics Show each June in Chicago. In another CES innovation, CLAUG now holds a special dinner meeting, attended by a busload of Atari-world top executives, which is the closest thing to an Annual Atari "Roast." CLAUG exemplifies the kind of creative dedication that represents Atari users groups at their best.

ANTIC AWARDS



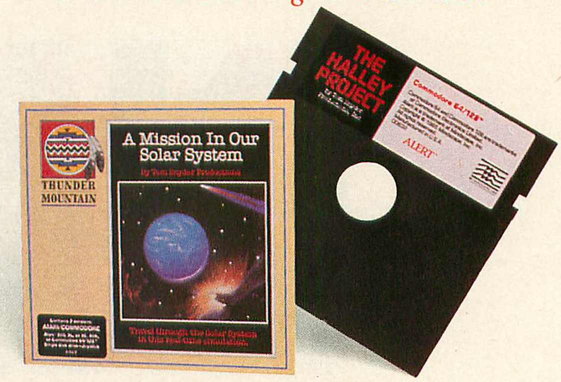
ISD Spreadsheets

Outstanding Product

VIP Professional is the only spreadsheet available for the Atari ST that is fully compatible with Lotus 1-2-3, the industry standard. VIP adds GEM's smooth graphic interface to the power and flexibility of 1-2-3—it's command and file compatible. The simpler but still powerful **Masterplan** is a scaled-down version of VIP Professional, trading full Lotus compatibility for a friendlier user interface and a lower price.

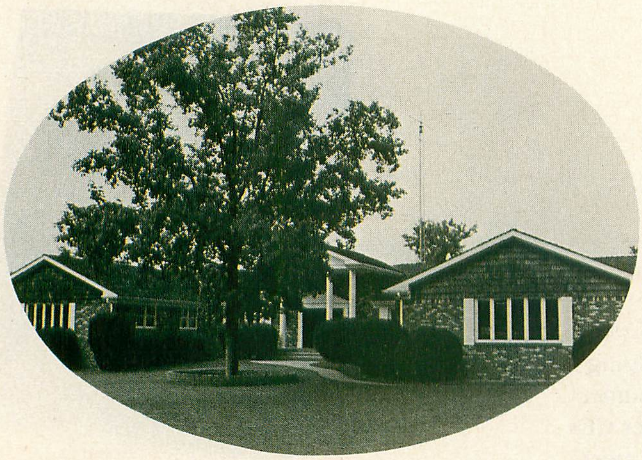
Thunder Mountain Software

Outstanding Product



ANTIC AWARDS

Thunder Mountain is Mindscape Software's "discount house"—a company dedicated to providing Atari 8-bit users with fine software for just $9.95 . Thunder Mountain has a full line of educational and entertainment titles as Songwriter, Mission in Our Solar System, Run for the Money and Batty Builders. Many Thunder Mountain releases are reissues of successful older software that otherwise would be unavailable.



Midwest Computer Camp

Outstanding Service

Housed on a magnificent old estate in the woods north of Indianapolis, Midwest Computer Camp is the largest full-time, year-round residential computer education camp in the U.S. Campers from age 8 to 18 spend six hours a day on computer activities, and there's a counselor for every four campers. Just about every conceivable brand of personal computer is available, including plenty of Ataris.

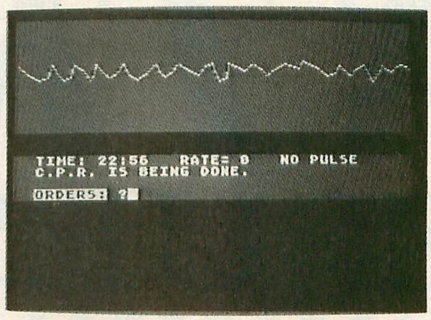
dBMan

Outstanding Product

If you're an ST user who is experienced with the industry standard dBASE III database software, **dBMan** by Versasoft is the serious ST database system you're looking for. dBMAN supports command files, local and global memory variables, and permits flexible report creation. The software gives professional database designers the flexibility and power needed to develop turnkey systems.

Cardiac Arrest!

Outstanding Product



A 1988 episode of television's "St. Elsewhere" featured a computerized medical simulator that enabled doctors to practice emergency techniques before treating human patients. That's just what **Cardiac Arrest!** delivers—for both Atari 8-bit and ST computers.

Our medically trained reviewer (May 1987) called Cardiac Arrest! "fascinating, useful and an invaluable study aid in Advanced Cardiac Life Support." Cardiac Arrest! is produced by Mad Scientist Software, physician Bruce Argyle's small Utah company which exemplifies how individual Atari enthusiasts can successfully bring a fine commercial product to market.



Supra Corp.

Outstanding Product



Supra's fine product line of hard disks, modems and buffer/interfaces has long been in the forefront of hardware support for both Atari 8-bit and ST computers. Supra's ST hard disks come in a full range of memory sizes, including 10Mb, 20Mb, 60Mb. And Supra produces one of the very few hard disks made for 8-bit Ataris. The new Hayes-compatible **Supra-Modem 2400** is another excellent product which will be reviewed in next month's **Antic**.

Firebird Software

Outstanding Product

Those hit games, The Pawn, The Guild of Thieves and Star Glider all come from one place—**Firebird Licensees**, probably the most prolific Atari game marketer for the past year. Firebird's games combine flashy graphics with flashy packaging—and not just for the ST. Many titles are now available for the 8-bit Atari as well.

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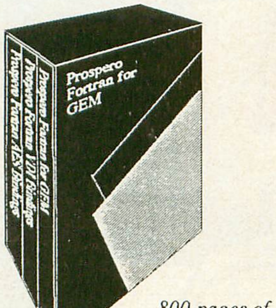
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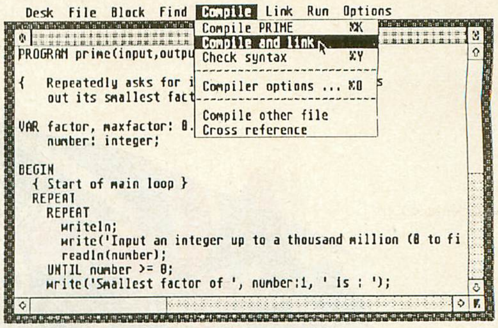
The **programming environment** is designed to stay resident in your Atari while you are programming. It controls the editor, the compiler, the linker and utility programs, and allows you to run the program you have compiled or any other program.

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The Powerful Parrot II software lets you record sounds into your computer and play them back on any Atari. Parrot II turns your computers keyboard into a musical instrument with nine different sounds covering three octaves each. The sounds can be anything, a dogs bark, a piano, a complete drum set, a symphony or your own voice.

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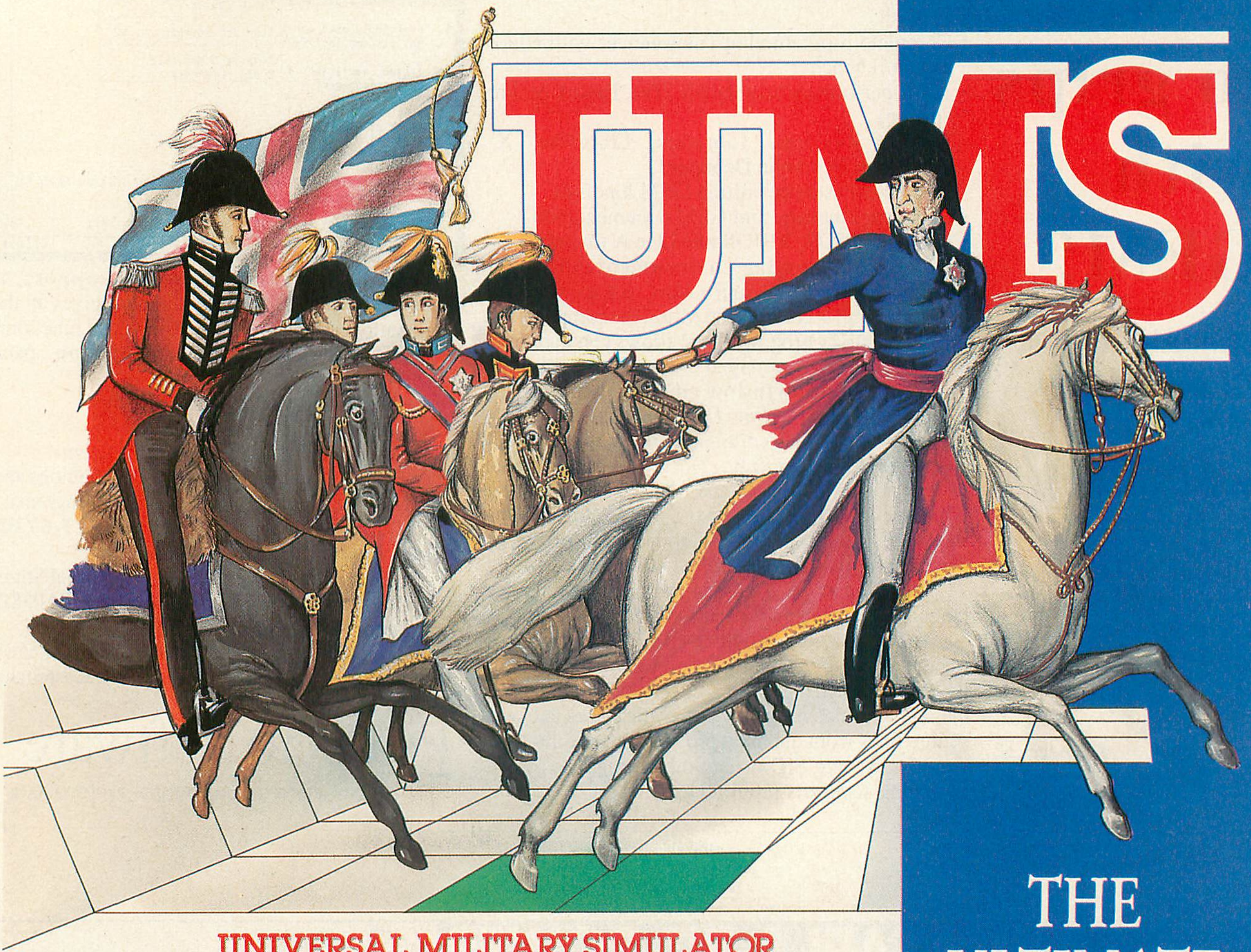
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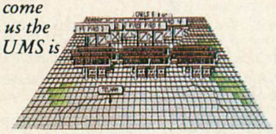
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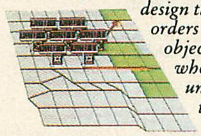


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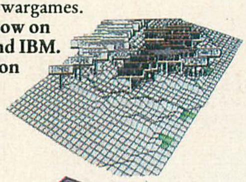


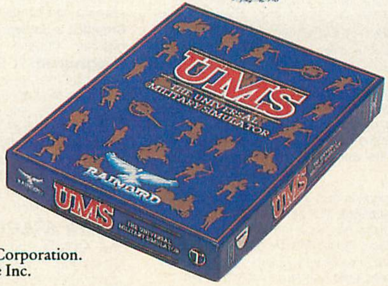
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Screenshots from Atari ST.

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CIRCLE **030** ON READER SERVICE CARD



Crazy Chicken Barrage

Watch out for the eggs, grenades and knives!

By STEPHEN EVERMAN & PAUL PRATT

Type-In Software

Ever want to just chuck it all and get a chicken farm? Well, you'll change your mind after playing Crazy Chicken Barrage, because this farm is out to get *you!* The game runs in low resolution and a color monitor is required.

High in their roosts above the barnyard, your hens produce egg after egg—and then they toss them down without a second thought. If you don't want to go broke, you must catch each egg before it splats on the ground. To make things even worse: You're stuck with war surplus chickens—a rare breed that lays hand grenades and knives as well as eggs. It's almost as if the chickens want to make sure that you "buy the farm" in more ways than one.

But you do have four lives and your profits are stored as points on the disk, so your heirs can remember you fondly.

GETTING STARTED

Using Michtron's GFA BASIC, carefully type-in BARRAGE.BAS and Save a copy before you Run it. Antic Disk users who do not own GFA Basic will find a ready-to-run version of the program, BARRAGE.PRG, on the back of the monthly disk—along with a Help file explaining how to transfer the program to an ST disk.

To start playing Barrage, click on PLAY. The farm boy onscreen jumps into egg-catching position and the action begins.

Moving your mouse left and right moves the farm boy accordingly. Help him grab those eggs before they splat. That's tough enough, and it gets tougher. You start off with one egg, but eventually you'll have to juggle four at a time. Then just when you think you've gotten the hang of that, there'll be something even tougher to contend with—another round.

There is no limit to the number of rounds you can play,

continued on next page

and as the game proceeds, the eggs fall at different angles and speeds. They might become grenades that explode if they hit the ground, or knives that kill if you catch them (so let them drop!). And everything keeps falling faster and faster.

When you just can't take the pressure anymore, flee to the entry screen by clicking the mouse. When you're ready, click on PLAY again and you'll return to the round you left.

When your feathered friends finally do you in, your score is saved to disk if it's higher than previous high score. And if there isn't a high score file on the disk, the program will create one.

PROGRAM NOTES

The first thing we do after checking the resolution with an Xbios function is to store the screen memory address in the variable Scr_mem by LPEEKing address 1102.

Next, the Fix_colors( ) subroutine saves the user's current color palette in the Pal array. Few things are as annoying as a program which colors your screen with arcade-like hues, then neglects to restore your *original* screen colors.

Fix_colors is a simple routine which may be used to save a user's palette at the start of a program, and restore it at the end. Use the statement Fix_colors(True) to save the original palette, and Fix_colors(False) to restore it.

We then Gosub to In_hi_score and get the high score from the disk. If there isn't a HI_SCORE.EGG file, we'll be routed to the procedure that creates one.

Now we take Scr_mem down to Assign_objects, where we change the data at the end of the program into objects.

The Get command stores a piece of the screen as a string which can be put back onscreen with the Put command. We'll use the Get command to store our objects in arrays. For example the Egg, Grenade and Knife are all stored in an array called Egg$.

Egg$(0)=Egg

Egg$(1)=Splattered Egg

Egg$(2)=Hand Grenade

Egg$(3)=Knife

Assign_objects first creates three erasers (by getting three pieces of blank screen) that erase the boy, egg and score respectively. Then *all 16* of the screen colors are set to the same color so when we begin Poking our data into screen memory, we won't see it happening. Once all the colors are the same, we begin pumping out data onto the screen and catching the objects in arrays until we've created the pictures we're going to use.

Here's how we get the three boy icons (walking left, walking right and middle) into their arrays: The outer loop "For Boys=1 to 3" says to create all three boys the same way. It is the inner loop "For X=0 to 30" that can be tricky. This loop gets the data from the Data statements and draws the boys in the upper left corner of the screen, so we can capture them into arrays with the Get command.

SCREEN MEMORY

Scr_mem can also be considered the beginning of the first 16 pixels of screen memory. Unfortunately we need four color planes of 16 bits each to create the first 16 pixels on the screen, so the first 64 *bits* of screen memory are all dedicated to the first 16 *pixels* of screen memory. That is, for every 16 pixels across the screen, we have to Poke four words of data.

The loop names these four words Plane1, Plane2, Plane3 and Plane4. We then Poke them directly into the upper left corner of screen memory. But our boy is only one word wide, so we aren't interested in the second set of 16 pixels in screen memory. We are interested in the 16 pixels directly below the first 16, So we multiply X by 160—the number of bytes across the screen—to get the screen memory address where the second set of 16 pixels begins.

Once all of our objects are safely tucked away in arrays, we return to the beginning of the program and set up the eggs' characteristics for the first round. We'll run them through a loop that accesses the New_egg subroutine using the command @New_egg(Numegg).

An egg's characteristics include its X-Y position, speed of descent and whether it falls straight or at an angle. In fact, an egg can be "not an egg at all", but a hand grenade or knife. The procedure New_egg always makes a new object an egg that drops straight down. Then it accesses the subroutine according to the level you're on: if you were on Level 5, the program would Gosub to Procedure Lev5.

This would send you to Procedure Grenade to see if the egg should be turned into a grenade, and then the speed of the falling egg is set randomly. The characteristics of an egg are kept in arrays whose reference number is the *number* of that falling object.

Let's skip down to Procedure Main. First, let's make sure the falling object has characteristics with a Gosub New_egg(1). The While loop circles until we push a mouse button and the variable Play becomes false.

Now let's dispose of the three If/Endif segments of the procedure. The first simply checks to see if a button is pressed. Then it removes all the falling objects from the screen, makes the boy dance, and leaves Main. The second If Dance=True does a Gosub to Dance. The If steady>4 statement puts a standing boy on the screen at the X position of your mouse after five cycles through Main.

CAUTION: FALLING EGG

Procedure Egg_drop sets the falling object to the first object, array number 0. Then a Repeat/Until loop is set up to cycle until all of the falling objects that are suppose to be on the screen have been drawn.

The first three lines after Repeat erase the old object, add its vertical offset (or speed) to its vertical position and

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ST Graphics Tablets

If you dislike "drawing with a bar of soap. . ."

Reviewed by FRANK HAYES

The ST mouse is great for selecting an onscreen item by pointing and clicking. That, after all, is what it was designed for. Unfortunately, for other things the mouse simply doesn't work as well.

For instance, boot up your favorite ST drawing program and use the mouse to sign your name on the screen. If you're like most people, you'll find it's a little uncomfortable—and the result won't be a very good sample of your signature.

Many artists find that they have a similar problem when they try to use a mouse with computer drawing programs. As computer artist Eleanor Kent once commented, "Working with a mouse is like trying to draw with a bar of soap."

Fortunately for ST users there's an alternative. You can do your drawing with a stylus and a graphics tablet.

What's a graphics tablet? Put your hand on your ST's mouse. Now imagine that the mouse has suddenly transformed itself into a pen, and your mousepad has changed into a small drawing board. That's what a graphics tablet is like. To the ST, it appears to be a mouse, but you use it much more like a pencil and drawing board. Use that electronic pencil to sign your name and you'll probably produce an easily recognizable signature.

ARTABLET

Two graphics tablets for the ST are the **ARTablet**, available from EI/O Products, and the **ProTablet ST** from Quantum. Like other peripherals such as modems, printers and scanners, these graphics tablets aren't built just for the ST. They can be connected to a wide range of other computers. But the ARTablet and ProTablet both come with driver software that's specifically designed to work on the ST, making these tablets more productive and easier to use.

The ARTablet from EI/O Products uses a graphics tablet manufactured by Summa. It comes in various sizes. We reviewed the smallest and least expensive ($395), which measures 9-1/2 × 13 inches physically. However, the actual drawing area is only about 6 × 9 inches—slightly larger than your ST's screen.

What's the ARTablet got to recommend it? Like a regular ST mouse, it has two "buttons" on the pen. When you would normally press the left mouse button, you simply press down a little harder with the stylus. That makes sense, since most ST drawing programs let you draw by pressing down the left button. The "right button" is a real button on the side of the stylus.

The graphics tablet itself sets up at an angle, like a drawing easel. The cords are long enough to give you plenty of flexibility when you're using the tablet and stylus. Best of all, the software is designed to let you use either the graphics tablet or the mouse. The graphics tablet has priority, but it's very easy and convenient to simply put down the stylus and use the mouse whenever you want to.

The disadvantages? The biggest one is the ARTablet's fairly small drawing area. It feels a little cramped when you're trying to do detailed work—though that's probably not such a problem with the larger sizes. The replaceable plastic tip in the stylus isn't as smooth as a metal tip would be for writing or drawing, and the stylus connects to the underside of the graphics tablet. As a result, the ARTablet can't lie flat on your desk, but must be angled like an easel. It's also too easy to accidentally hit the button on the stylus.

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ST New Products

by GREGG PEARLMAN, *Antic Assistant Editor*

MICHTRON QUINTS

The Juggler ($49.95) is a switching program that lets you keep *seven* GEM applications in memory at the same time and access them via the "switchboard," making it easier to move from one to the other. The Juggler recognizes .PRG, .TOS and .TTP files.

Create pictures and complex animations with **GFA Artist** ($79.95), save them in a special run-only file that allows up to 20,000 frames per film, then show them off to your friends. You can incorporate text into your pictures in a custom font (or one of the four provided ones), employ color cycling, even define your own fill pattern from part of your picture. With the Film Merger, you can merge into a *single* file several film files.

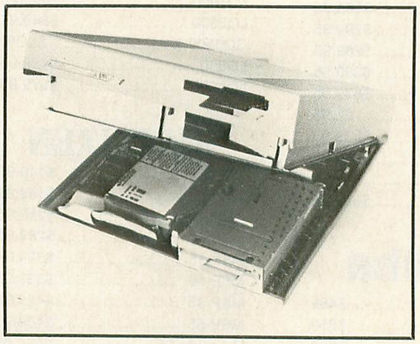
The Low-Res Static mode lets you use over 1,000 colors onscreen at once, and the Function Selection box integrates both low and medium resolution into one screen, combined with multiple palettes. The program is compatible with DEGAS and NEOchrome formats, and it requires 1Mb of RAM, TOS in ROM and a color monitor.

Master CAD ($249.95) lets you create complete, exact 2-D and 3-D graphics and *project* 2-D designs onto 3-D images without having to waste time building data matrices or fighting with inadequate user interfaces. You can move, copy, rotate and flip any object horizontally or vertically, change their proportions and textures, and export or import them to and from other objects. You can observe objects from various viewpoints, external or internal, transparent or solid, or observe the objects in orthogonal, perspective, axonometric and oblique projections from any angle as well as spin them around any axis. Master CAD uses the screen as a "window" into a workspace with about 2,300 miles in each positive or negative access direction.

PreSchool KidProgs ($39.95) stimulates the development of young children with KIDGRID +, a drawing program with 192 trangles that can be filled with one of 12 colors, KIDKEYS, which lets children choose one of 20 songs or create their own on the three-octave keyboard, and KIDBLOCKS, a multi-sided block puzzle to be unscrambled. PreSchool KidProgs requires a color monitor.

Microdeal's **Slaygon** ($39.95) is the most sophisticated military robot ever created. Controlled from within by one highly trained specialist (you), Slaygon possesses the strength of 100 men, the armor and weapons of a small tank—and your brain—as you attempt to destroy the Cybordynamics Laboratory before the finalization of a toxic virus designed to annoy all human life. You must circumvent security robots through five miles of hallways and 500 rooms, but you'll be aided by a cloaking device, short-range scanner and energy shields.

Michtron, 576 S. Telegraph, Pontiac, MI 48053. (313) 334-5700.
CIRCLE **190** ON READER SERVICE CARD



MEGADRIVE

Supra's **MegaDrive ST** hard disk connects to the ST's internal DMA port, leaving the external DMA port free for additional expansion. The MegaDrive allows full autobooting from the hard drive and comes with formatting software that lets you partition the hard disk into as many as 12 logical partitions. Power for the hard disk comes from the computer's own power supply.

20Mb: $649; 40Mb: $1,049. Supra Corp., 1133 Commercial Way, Albany, OR 97321. (503) 967-9075.
CIRCLE **184** ON READER SERVICE CARD

DARK CASTLE

In **Dark Castle**, you must connive and survive your way through 14 danger zones in your quest to vanquish the Black Knight. Dark Castle, a former Macintosh hit, features colorful animation and fascinating sound as you encounter trick after trick, test after test, trap after trap.

$44.95. Three-Sixty Pacific, Inc., 2105 S. Bascom, Campbell, CA 95008. (408) 879-9144.
CIRCLE **186** ON READER SERVICE CARD

TRANSPUTER PRINTER

CSS Laboratories' **transputer-based laser printer** incorporates Inmos Ltd.'s 15 million instructions per second (MIPS) T800 chip, which supports true parallel processing. It also incorporates a math coprocessor and 4K of memory directly into the microprocessor chip itself.

The printer can produce five to 20 pages per minute and can be upgraded to any laser printer engine for speeds of up to 50 pages per minute. All you have to do is buy the faster engine and an inexpensive "personality module." CSS expects to support up to 200 pages per minute by the third quarter of 1988.

$2,990. CSS Laboratories, 1641 McGaw Avenue, Irvine, CA 92714. (714) 852-8161.
CIRCLE **183** ON READER SERVICE CARD

THREE FROM DATASOFT

You're Soviet submarine captain Marko Ramius, and you want to defect to the United States with your state-of-the-art sub, the Red October. In **Hunt for Red October** ($49.95), based on the best-selling novel by Tom Clancy, your objective is to rendezvous with the U.S. Navy and fake a radiation leak, thus providing a reason to evacuate the 113-man crew. Then the Navy will smuggle the sub into a U.S. port. (You can't sail openly into U.S. waters. Under maritime law, the Soviets would simply reclaim the vessel.)

In **BattleDroidz** ($34.95) you control one of three "droidz" in combat on a faraway planet. BattleDroidz includes 3-D scrolling action and 37 different landscapes to explore.

As the **Global Commander** ($39.95), your word shapes the world. Your job is to coordinate the satellite network orbiting Earth and act as the planet's chief negotiator. Your domain includes 16 United Nuclear Nations and a network of satellites which monitors the airwaves for information regarding each nation's status.

Intellicreations (Datasoft), 19808 Nordhoff Place, Chatsworth, CA 91311. (818) 886-5922.
CIRCLE **185** ON READER SERVICE CARD

New ST product notices are compiled from information provided by the products' manufacturers. ***Antic*** *assumes no responsibility for the accuracy of these notices or the performance of the product.*

ST Toolbox

Make It Move, Payroll Master

MAKE IT MOVE

Make It Move is an impressive animation design tool, although it is *not* a drawing program. It lets you define sprite-like objects from NEOchrome or DEGAS .PI1 graphics files. You then can create fairly sophisticated animations with these images.

The package includes two disks containing the programs and a tutorial. Every screen illustration in the 29-page manual is almost too dark to recognize and the manual doesn't tell you how to recode animations on videotape. But it *is* nicely indexed, and the appendix contains short explanations of each command.

The first program you'll use is OBJECTS.PRG, which lets you select the sprite images for your graphics presentation, but you'll have to draw your artwork before using any of the Make It Move programs. You can load two graphics files into memory at once or use one of the file buffers as a clipboard. Once your artwork is in a file buffer, you select the images with a rectangular "rubber band box" pulled over the desired area of the image. Then you can name each image for reference.

You can change your picture file format easily with OBJECTS.PRG. You can load a NEO file and save it as a DEGAS .PI1 file. Another nice feature is the facility for creating zoom files of a single object. The object can zoom from a small speck to the full-scale image on the horizontal and/or vertical axes. Then you can incorporate the zoom files into your script.

Keep your background simple—it isn't always transparent in your animations. Also, your presentation will use the color palette of the full screen display of your script—which is not necessarily the same as a given object. After you've selected all the objects you want, the file containing them must be stored in a special compressed format which is *not* the same as the DEGAS Elite compressed format.

Make It Move has very sophisticated scriptwriting facilities. You can display, hide and move your defined objects around the screen at given times, but there's no way to rotate objects other than page-flipping.

Make It Move excels in screen wipes and fades. The 13 options range from fading into a given color to digital dissolves in geometric patterns. These options let you create very professional-looking productions.

The SCRIPT.PRG program lets you view scripts in segments or in their entirety while constructing your presentation. A separate program, VIEWIT.PRG, lets you view a finished presentation. The VIEWIT.PRG is designed to be copied and distributed for the sole purpose of viewing scripts, but it is not public domain.—TOM CASTLE

$59.95, color. Michtron, 576 S. Telegraph Road, Pontiac, MI 48053. (313) 334-5700.

CIRCLE 170 ON READER SERVICE CARD

PAYROLL MASTER

I bought an Atari 520ST computer intending to phase out the Apple III that I use at work. My first step was to find a payroll program that does everything the $395 Apple program can do. Royal's **Payroll Master** not only meets the challenge, but surpasses it. With a retail price of $79.95 and the fact it runs on a stock 520ST, there's no reason not to use Payroll Master for any small to medium-sized business payroll.

The program comes on an unprotected master disk—fantastic, since backup copies are essential. Payroll Master is easy enough that a 350-page manual isn't necessary. If you do have questions, assistance is only a phone call away, and a disk replacement/update service is offered for a minimal charge. The program itself is GEM-oriented, and payroll data is memory-resident (so execution is *fast*). Up to 400 employees can be entered.

After a few numbers and mouse clicks, you're done with an employee. You can process everyone, or only selected people. Payroll Master provides user-definable federal, state, city and local tax tables, which you can enter easily. This negates any tax update service (which my Apple needed at over $100 annually). Also, you can add five user-defined deductions. The program supports weekly, biweekly, monthly and semimonthly pay periods, along with hourly, salary and base-plus-commission pay types. Vacation and sick leave are tracked for convenience.

Dragging with your mouse and clicking gives you a check "mask" of your own design so you can use virtually any preprinted paycheck form. Reports included are payroll registers, employee information and month/quarter/year-end registers. W-2s are printed at the end of the year also.

You can send reports to the printer or a disk file. The "dump report to disk" feature also lets you save the reports as text files. So if you lose your hard copies, you can always bring up the text file for any pay period.

I wish the payroll register was shorter (although I suppose it's possible that I might have missed an obscurely documented alternative for-

continued on next page

ST TOOLBOX
continued from page 57

mat). I need a report with only the check number, employee and net amount, but so much other information is included on this report that it's several pages long. However, I soon learned to overcome this by printing my register report to disk and editing the file before I make a hardcopy.

I also wish that Payroll Master would automatically skip everyone who has already had their paychecks printed for that pay period. I generally have to print checks for different parts of my 40-person staff at different times—and if I just select Print All, duplicate checks for the previously paid employees are printed. In addition, I would sometimes find it helpful if the program had a small ledger system for posting special situations to the accounts involved.

Still, Royal Software has a real winner. Anyone looking to process payrolls efficiently, inexpensively and painlessly should look at this program—especially if you have just a single-sided drive and 512K of memory.—FRANK TOMECEK

$79.95. Royal Software, 710 McKinley Street, Eugene, OR 97402. (503) 683-5361.
CIRCLE 171 ON READER SERVICE CARD

ST GRAPHICS TABLETS
continued from page 53

There are no switches or calibrations to set for the ARTablet—you just plug it into your ST and begin using it. All in all, it's a convenient and useful way to draw.

PROTABLET ST

Quantum's $395 ProTablet ST is manufactured by Mitsubishi. This graphics tablet is much larger than the ARTablet we tested—11×17-1/2 inches, with an 8×12 inch drawing area. That's almost twice the drawing area and a big advantage. The ProTablet has a number of other attractive features—but with that power comes much more complexity.

For example, the ProTablet's metal-tipped stylus works with a smooth, light touch and you can replace the metal tip with a ball-point pen tip if you like. But there's no second button on the stylus—you can only click by pressing harder with the stylus. Supposedly you can click the right mouse button by clicking with the stylus in one of the corners of the tablet, but it's difficult to use correctly.

You can also scale the drawing area for your particular work, using only a portion of the tablet's drawing surface for the whole ST screen. This makes it much easier to trace a drawing into DEGAS or into a CAD program. It's very easy to reset the scaling. Too easy, in fact—the scaling seemed to reset itself even when we didn't want it to.

Many of the ProTablet's options are controlled by 10 DIP switches on the underside of the tablet, which are supposed to be set correctly for the ST when you receive the tablet. Ours weren't, and we had a difficult time getting the switch settings right. If they're wrong, you may get no results at all.

But there are some major advantages to the ProTablet too. All the connections are made to the rear of the tablet rather than the underside, so the tablet can either sit flat or set angled as an easel. The power-on LED makes it easy to tell whether everything's connected properly. And though you can't use the mouse and tablet at the same time, you can easily switch between them using the software, which comes in the form of a Desk Accessory program.

One of the best features of the ProTablet is the optional drawing puck. The puck plugs into the ProTablet tablet, replacing the stylus. It looks something like a mouse with crosshairs, and it allows very precise tracing. That's extremely useful when you're trying to copy a sketch into a drawing or CADD program. The puck has felt pads on the underside, so it glides very smoothly across the surface of the graphics tablet. There are also four buttons on the puck, solving the "missing button" problem. Unfortunately, the software version we tested only recognized one of the buttons.

The puck exemplified the ProTablet. It was wonderful, but I wished the software was easier to use and made better use of the hardware.

Fortunately, both Quantum and EI/O Products have promised to improve and update their software. If you only need your mouse for choosing items from dropdown menus, you certainly don't need a graphics tablet. But either the ProTablet ST or the ARTablet will make your life much easier if you're an artist, drafter or other graphics professional who's tired of drawing with a bar of soap.■

ARTABLET
$395, 6×9 inches
EI/O Products
1559 Rockville Pike
Rockville, MD 20852
(301) 869-5984
CIRCLE 290 ON READER SERVICE CARD

PROTABLET ST
$395, 12×8 inches
Quantum Microsystems Inc.
P.O. Box 179
Liverpool, NY 13088
(315) 451-7747
CIRCLE 291 ON READER SERVICE CARD

WordPerfect ST

Proving why it's the IBM PC bestseller

Reviewed By GREGG PEARLMAN, *Antic Assistant Editor*

WordPerfect ($395) is now by far the most powerful and complete word processor available for the ST. And we're pleased to report that the latest release (January 29) seems to have cleared up all the bugs from earlier shipments.

WordPerfect, the longtime best-selling word processor for IBM PCs and compatibles, is known for being crammed with high-powered features—which require an arsenal of commands to master them all. Even WordPerfect's ST quick-reference card runs five text pages. However, you can operate WordPerfect either with keyboard commands or by clicking on menu selections with your mouse.

Throughout 1986-87, WordPerfect Corp. of Utah demonstrated their commitment to the Atari market by showing off beta versions of their ST adaptation at Atari Fairs. This company has earned an enviable reputation for customer service. They constantly upgrade and enhance their main product, instead of spreading themselves thin with a lot of different software like so many other publishers.

When significant bugs turned up in the earlier releases of the ST conversion, WordPerfect Corp. left no doubt that it would keep on providing their customers with free upgrades until the debugging was successfully completed. I also personally found that the customer service people at WordPerfect's toll-free 800 number live up to their reputation for being extremely helpful and friendly. They'll go the extra yard to solve your problem.

The WordPerfect software consists of six *non-protected* disks. This means you can back up each disk and customize several different versions of the program. And you can copy them to a hard disk for vastly increased convenience and speed. Of course, WordPerfect Corp. doesn't need to worry too much about piracy: WordPerfect is almost unusable without its manual of over 600 pages!

GLOBAL REPLACE

You'd think that such a huge manual would provide adequate documentation about each feature. But unfortunately that's not the case. Too often, you'll read and reread an instruction until the words fall off the page and you *still* won't know exactly what to do. For example, later on in this review I'll explain the tortuous process I needed to go through before figuring out how to build a personal dictionary and add it to the built-in 115,000-word main dictionary.

In the normal course of my word processing, I often perform search-and-replace functions. Perhaps I downloaded or Linklined a document and must excise all unwanted carriage returns, or I must replace all five-space tabs with paragraph symbols.

To test WordPerfect, I loaded a 2,000-word document that had been printed to disk. Onscreen, most lines started 10 spaces from the left-hand margin. The newest release took 11 seconds for a global delete, replacing nine spaces with "nothing." The same process on a 20,000-word document took 97 seconds. This is an impressive improvement over our older version, which needed one minute for 2,000 words and nine minutes for 20,000. Now if only the marker on the slider bar would descend as the search progressed. . .

It's easy to scroll up or down with the arrow keys, but if you move the slider-bar cursor with the mouse, the screen will take a few seconds (depending on file size) to reposition. You can have as many as five columns of text onscreen.

I was unable to find a way to search-and-replace symbols for turning off boldface, italics, etc. Many other word processors will let you do this. I alerted WordPerfect Corp. about this difficulty—which doesn't exist in the IBM version—and it should be taken care of in the next upgrade. Part of the problem seems to be that WordPerfect ST is virtually a WYSIWYG program. While most other word processors have a Print Preview mode, in WordPerfect ST you're *always* in Print Preview.

There is a "reveal codes" option that shows the text as well as carriage returns, control codes and the cursor (each taking up at least two spaces). You must highlight a block of text in order to boldface or italicize it.

SPELL CHECKING

Spell-checkers can be fascinating. ("How do they *know*?") And the scope of the WordPerfect spell-checker is truly astounding.

The 115,000-word dictionary is divided into Common and Main dictionaries. When WordPerfect encounters a suspicious word during a spell-check, it first checks the Common dictionary. It switches to the Main dictionary only after coming up empty. If the Main directory provides no answers, it displays a couple of dozen similarly spelled words to choose from. Just click on the appropriate spelling to replace the document's version. You can even look up a word phonetically.

Spell-checking a document is not a particularly fast

continued on next page

WORDPERFECT ST
continued from previous page

process—sometimes you have to click (or press a key) two or three times for the program to accept, skip or let you edit a word. Updating a dictionary takes about five minutes of disk access, even on a hard disk. It's probably a good idea to place the dictionary files on a RAMdisk, if you have one. In fact, it's fun watching the spell-checker use the RAMdisk dictionary to zip through your document.

ADDING WORDS

New user-approved words are saved to a supplementary dictionary which seems to fill up fast. I had all kinds of trouble checking documents when my supplementary dictionary had reached a scant 4K. The answer, which is not documented, is to add the extra words to the main dictionary after the supplementary dictionary fills up about halfway.

This you must do via the Speller Utility disk—also a wise thing to copy to your hard disk—which lets you create an auxiliary dictionary, add or delete words in the Main or Common dictionary either by typing them in or by loading another dictionary file, optimize (compact) a dictionary you've created, display words in the Common list, check which dictionary contains a word, and look up a word in the standard way or phonetically. When it encounters the same word twice in a row (word word), the spell-checker will ask if you want to skip or accept the double word.

WordPerfect has a fine Thesaurus function. Choosing the Thesaurus program brings up a three-column window: the first column shows the word under the cursor in the text, along with several synonyms to choose from. Clicking on one of those words brings up a second column showing *its* synonyms. Clicking on one of those brings up the third window.

You can replace a word with one you've chosen, look up a word, clear a column, or view your document. Sometimes, however, you'll find that the word you're looking up isn't a "headword"—which simply means that it *can't* be looked up in the thesaurus. Each headword is classified as an adjective, noun or verb.

SETUP AND PRINTING

The setup program lets you set your default drive(s), telling WordPerfect where to find not only your main text files, but your dictionary and thesaurus files as well. The program currently has settings for 259 printers, and you can store drivers for six at a time.

It may be a minute or so before the printer actually starts doing its stuff, because of all the disk access required. I had trouble getting an accurate printout with **Antic**'s Epson RX-80 compatible Panasonic KX-P1080i printer (reviewed in the April, 1988 issue), whether I used the program's built-in Panasonic driver or the Epson FX/RX driver.

It's easy to convert files to WordPerfect format from ST Writer, 1st Word and Word Writer formats. Just run WordPerfect's conversion program, specify the file type and furnish filenames. Conversion of a 100,000-byte ST Writer file took one minute, 38 seconds on a floppy disk, 14.8 seconds on a hard disk and a quick 4.3 seconds on a RAMdisk.

Oddly enough, our newest (January 29) WordPerfect release no longer converts ST Writer files. However, WordPerfect Corp. says a fix is on the way. Meanwhile you should have no trouble using the conversion program from an earlier (January 8) release.

SUMMING UP

If you want to own the most power-packed word processor available for the ST today, and can live with the relative complexity needed for harnessing this power, WordPerfect is what you've been waiting for. The company's excellent track record for supporting its software is also a significant factor. WordPerfect is widely available at substantial discounts below its $395 list price. And for full-time students or educators who can verify their status, there's a special price of only $99. ■

WORDPERFECT
WordPerfect Corp.
288 West Center Street
Orem, Utah 84057
(800) 321-4566
$395, color or monochrome

CIRCLE **173** ON READER SERVICE CARD

CRAZY CHICKEN BARRAGE
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print the object. Once the object is Put on the screen, we wait for the next vertical blank with the command Vsync, then add the object's horizontal movement to the X position to prepare for the next movement.

The rest of the routine is a series of nested If statements that check to see what happens to the object we just drew.

The Difficulty procedure takes care of all bookkeeping for the program. It changes the levels, keeps track of the number of fallen eggs and awards bonuses. The first thing it does is Decrement Eggs_available, which is the number of objects that must fall before we add another falling object.

The Walk procedure makes sure that the X position of your mouse is in bounds and that you have moved the mouse. If so, the procedure then checks to see which direction the mouse is going in—whether the new position is larger or smaller then the proceeding position.

If the position is larger, we set the variable Obj to 3, and if it's smaller, the variable is set to 2. The left-walking boy is Obj$(3) and the right-walking boy is Obj$(2). So by replacing the number with the variable, we automatically switch to the corrected picture. ■

Paul Pratt and Stephen Everman published Maze Master *and* Pascal Towers *in the March 1988* **Antic** *and BASIC Concentration in April 1988.*

FOR MORE ARTICLES LIKE THIS, CIRCLE **195** ON READER SERVICE CARD.

Listing on page 72

New ST Entertainments

From dungeons to outer space

ROADWAR EUROPA

I loved the original version of this game and I love this sequel. Despite a less than original premise (remember Mad Max?), **Roadwar Europa** puts you in command of a roving band of vehicular warriors, fighting for control of radiation-ridden roadways of the future.

On this outing, the scene is Europe and its world-threatening terrorists. It seems that a rather ugly faction has planted five nuclear devices in major European cities. The detonation of the first one is just to let you know they're serious. Unfortunately, what you don't know is the location of the other four. The object of the game is to defuse these bombs and save the world. Feel up to it?

What makes this complex game such a joy to play are its logical, simple design and ease of use. Start out by allocating vehicle, manpower, and supply points to create a gang.

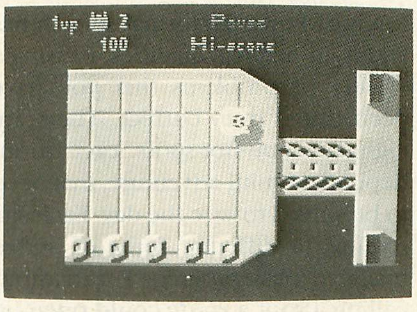
Game play follows a simple and hypnotic pattern. Move, search, fight—it couldn't be easier. What isn't easy is the strategy needed to complete the game. What kind of vehicle do I need? Should I risk another fight? Is your doctor healing your men, or merely an extra mouth to feed? These are only a few of the problems awaiting you.

Simple mouse/menu and alternative keyboard commands allow you to learn and play quickly. You'll soon graduate to the highly complex tactical battle mode, in which you control all aspects of your Roadwar, such as vehicle position, aim, movement, and ramming and boarding enemy vehicles.

A very attractive and well designed, high-res screen makes the mayhem easy on the eyes, while a generous manual also manages to ease you into this complex game. And a disk that's not copy protected makes sure you're the only one to blame for a defective disk.— STEVE PANAK

$44.95, color only. Strategic Simulations Inc., 1046 N. Rengstorff Avenue, Mountain View, CA 94043. (415) 964-1353.

CIRCLE **282** ON READER SERVICE CARD



URIDIUM, XEVIOUS

Space shoot-em-ups aren't news anymore and they aren't exactly my cup of tea either, so I was surprised to enjoy Mindscape's **Uridium** ($39.95) so much. Detailed and life-like graphics are a real help and an easy joystick system is also a plus.

The playing style isn't that much different from Zaxxon except that scrolling goes straight across the screen instead of from corner to corner. The object of the game is also quite different. An enemy fleet of 15 Super Dreadnoughts is stealing minerals from 15 different planets in your galactic sector. You'll first have to knock out the fighters that protect the Dreadnought, while avoiding the homing mines that come from the ship.

To do that, your ship is equipped with an unlimited supply of phaser power and some pretty flashy maneuvering capabilities. When all the Dreadnought's defenses have been eliminated, you can land on the ship and destroy it.

For those weary of games with 100-page manuals, for those who just want to load the game and take off, Mindscape's **Xevious** ($29.95) is probably right up your alley. There are only 126 words in the manual about the ST version of the game.

Xevious is a vertically scrolling combat game, pitting you and your aircraft against a mighty arsenal of land and air forces from a enemy about which you know very little. The joystick controls sideways and up/down movement in a strictly 2-dimensional format. The button is used to fire an unlimited supply of bombs. The easy way to play is just leave the button depressed constantly for a continuous barrage of bombs. But a quick tapping of the button will actually produce more bombs at a faster rate. High scores are saved to disk.—RICK TEVERBAUGH

Color only. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. (312) 480-7667.

CIRCLE **285** ON READER SERVICE CARD

DUNGEON MASTER

Occasionally a game appears that is so revolutionary it immediately pulls ahead of the competition and sets standards for judging future releases. Zork and Flight Simulator II come to mind. Now there's **Dungeon Master**, a graphic role-playing fantasy written expressly for the ST and one of the few games taking complete advantage of 16-bit technology.

Dungeon Master is the first game where skeletons, dragons, mummies, et al. wander freely. Sometimes you can see your adversaries first, but once they see you, they'll stay hot on

continued on next page

your trail.

Dungeon Master's graphics are spectacular. Your main screen is a first-person view of the dungeon that scrolls by as you move. The detail is amazing, as fountains, chipped stones, and messages carved into them—many of them clues—add to the realism of the game. And the ST interface is outstanding. Everything is mouse controlled, from movement to casting spells. But what's amazing—more than hot animation, more than the interface—is the *sound*. Dungeon Master is almost worth buying for the sound-effects alone. All sounds are digitized, from the metallic clank of a door closing to the sound of an axe being swung through the air down to the comical "oof!"

Dungeon Master is more puzzle-oriented than its ancestors. In fact, there is hardly any combat in the first two levels at all. Instead, the game teaches you to be observant. The many hidden switches and panels in the walls may open a secret panel.

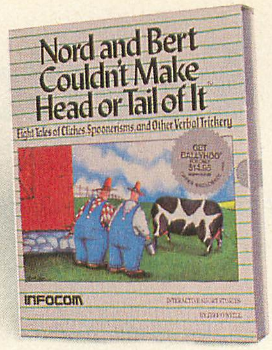
The only thing commonplace about Dungeon Master is the storyline where once again, an Evil Wizard has taken over control of the world. You must assemble a party of four adventurers (Fighter, Ninja, Wizard or Priest) to explore a 15-level dungeon.

Party members develop not by gaining "experience points" but by practicing their skills, as in real life. This gives character growth a more organic feel than other games of the genre. A hint book is on the way, and there's talk of Dungeon Master II—apparently there are 15 levels that didn't make it into the game. In the meantime, buy this game. It's one of the best games ever written for *any* computer.—HARVEY BERNSTEIN

$39.95. FTL Games, P.O. Box 11248, San Diego, CA 92111. (619) 453-5711.
CIRCLE 170 ON READER SERVICE CARD

NORD AND BERT

Nord and Bert Couldn't Make Head Or Tail Of It is the long-winded title to the latest offering from Infocom, the reigning masters of interactive text adventures. To put it mildly, Nord and Bert is a major departure from Infocom's previous adventures. Success in this game relies on solving word games, having total recall of cliches and believing firmly that the pun is mightier than the sword.



The underlying thread in Nord and Bert is that a verbal disaster has hit the town of Punster. Normal speech has taken on magical qualities, causing a variety of problems that you have been called in to correct. There are eight separate hot-spots, each an independent mini-adventure, that need to be solved to save the day. Each site requires a different form of verbal magic to make progress. For example, calling a root a *route* could open up a trail through an impassable forest. In another case finding the most laps would actually reveal lost maps.

Game play is also different in that all possible directions are posted on the screen. No need for mapping, the puzzles are reserved for word games. There's also an online hint feature—a necessity for this game, given some of its more obscure references. The starting point for each scenario is to determine what type of word game is being played. These are consistent—one scenario is all homonyms, another is spoonerisms, etc., with no overlapping.

Novelty aside, I cannot recommend this game. Its biggest flaw is inconsistency of play from one scenario to another. The puzzles are fairly trivial, compared to standard adventure games, but the word play ranges from easy to difficult. I love puzzles but when success rests on recalling every cliche in the book there is little challenge and less interest. The element of fairness is gone: either you know it or you don't, with no hope of finding a logical solution. I give Infocom an A for originality but will spend my money on something else.—JIM PIERSON-PERRY

$39.95. Infocom, 125 CambridgePark Drive, Cambridge, MA 02140. (617) 576-3190.
CIRCLE 172 ON READER SERVICE CARD

F-15 STRIKE EAGLE

In its original incarnation on the 8-bit Atari, **F-15 Strike Eagle** solidly established Microprose as the leading developer of flight combat simulation software. Now converted to ST format, it's essentially the same.

However, fans of the previous version will appreciate the enhancements designed to take advantage of 16-bit technology. The wire frame designs of the old targets have been replaced by true-to-life graphics. Planes, airfields, SAM sites, etc. all closely resemble their real-life counterparts. The ST version plays much *faster* too, adding to the excitement. One new element not found previously is the ability to save a pilot's performance to disk.

The game places you in the cockpit of an F-15 air/ground attack fighter. With the assistance of a sophisticated heads-up display (HUD), three major air-to-air weapons systems, (guns, medium and short range missiles), and computerized intelligence displays, you attempt to complete any of seven missions (based on actual military incidents) in places such as Libya, Egypt, Syria and Hanoi.

As is common with Microprose releases, the documentation is superb. The first part of the manual gives an overview of the game and controls, while an extensive second section deals with advanced defensive flight techniques, aerodynamics, etc. The manual also contains the authentication codes you need to get off the ground—sugar-coated copy protection.—HARVEY BERNSTEIN

$39.95. Microprose, 180 Lakefront Drive, Hunt Valley, MD 21030. (301) 771-1151.
CIRCLE 171 ON READER SERVICE CARD ■

SOFTWARE LIBRARY

DISK SUBSCRIBERS: Programs for 8-bit Atari computers can be used immediately. Just follow instructions in the accompanying magazine articles. ST Owners: See monthly disk's ST Help File for instructions on how to transfer programs to 3-1/2 inch disk.

DOS COMPATIBILITY: All 8-bit programs published by **Antic** are tested to work with Atari Disk Operating System (DOS) 2.0S and 2.5—*not* with the incompatible DOS 3.0. DOS 2.0S is available on each Antic Monthly Disk. Copy the DOS.SYS and DUP.SYS files.

TYPING SPECIAL ATARI CHARACTERS

Antic printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789 0123456789

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below.

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL S
	CTRL A		CTRL T
	CTRL B		CTRL U
	CTRL C		CTRL V
	CTRL D		CTRL W
	CTRL E		CTRL X
	CTRL F		CTRL Y
	CTRL G		CTRL Z
	CTRL H		ESC ESC
	CTRL I		ESC CTRL -
	CTRL J		ESC CTRL =
	CTRL K		ESC CTRL +
	CTRL L		ESC CTRL *
	CTRL M		CTRL .
	CTRL N		CTRL ;
	CTRL O		SHIFT =
	CTRL P		ESC SHIFT CLEAR
	CTRL Q		ESC DELETE
	CTRL R		ESC TAB

INVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	[Atari logo] CTRL ,		CTRL X
	[Atari logo] CTRL A		CTRL Y
	[Atari logo] CTRL B		CTRL Z
	[Atari logo] CTRL C		ESC SHIFT DELETE
	[Atari logo] CTRL D		ESC SHIFT INSERT
	[Atari logo] CTRL E		ESC CTRL TAB
	[Atari logo] CTRL F		ESC SHIFT TAB
	[Atari logo] CTRL G		[Atari logo] CTRL .
	[Atari logo] CTRL H		[Atari logo] CTRL ;
	[Atari logo] CTRL I		[Atari logo] SHIFT =
	[Atari logo] CTRL J		ESC CTRL 2
	[Atari logo] CTRL K		ESC CTRL DELETE
	[Atari logo] CTRL L		ESC CTRL INSERT
	[Atari logo] CTRL M		
	[Atari logo] CTRL N		
	[Atari logo] CTRL O		
	[Atari logo] CTRL P		
	[Atari logo] CTRL Q		
	[Atari logo] CTRL R		
	[Atari logo] CTRL S		
	[Atari logo] CTRL T		
	[Atari logo] CTRL U		
	[Atari logo] CTRL V		
	[Atari logo] CTRL W		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key instead.)

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be boxed. Compare the two sets of characters below:

SPECIAL		STANDARD	
	CTRL F		/
	CTRL G		SHIFT +
	CTRL N		SHIFT -
	CTRL R		-
	CTRL S		+

HOW TO USE TYPO II (8-BIT)

TYPO II automatically proofreads **Antic**'s type-in BASIC listings for 8-bit Atari computers. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at the left of the line number. Press the [RETURN] key.

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME" [RETURN] (Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Don't type the TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "K":POSITION 11,1:? "TYPO II"
EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "K":POSITION 11,1:? " TYPO III
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VU 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press RETURN and edit line a
   bove.":GOTO 32050
```

part II: mixed numbers sorting routine

SUPER SORTERS

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LISTING 1

Don't type the TYPO II Codes!

```
VL 1000 REM NUMERIC SORT DEMO
WI 1010 REM BY KEVIN PECK
VF 1020 REM (c)1988, ANTIC PUBLISHING
XT 1080 GOSUB 2000
SY 1130 DIM DS$(560),L$(7),F$(6),I$(8),T$
   (7)
FZ 1140 DS$=" ":DS$(560)=" ":DS$(2)=DS$
PD 1150 FOR I=1 TO 20:READ F$,L$,I$,T$
ZB 1160 PS=(I-1)*28+1
DF 1170 DS$(PS,PS+LEN(L$))=L$
QC 1180 DS$(PS+7,PS+7+LEN(F$))=F$
OR 1190 DS$(PS+13,PS+13+LEN(I$))=I$
KL 1200 DS$(PS+21,PS+21+LEN(T$))=T$
EW 1210 NEXT I
IX 1220 POKE 710,145:POKE 82,2
IE 1230 GOSUB 1470:POSITION 8,22:? "Origi
   nal, Unsorted data":GOSUB 1500
YH 1240 A=USR(ADR(SN$),ADR(DS$),ADR(DS$)+
   LEN(DS$),8,13,28,0)
YX 1250 GOSUB 1470:POSITION 6,22:? "Sorte
   d Ascending by Income":GOSUB 1500
WU 1260 A=USR(ADR(SN$),ADR(DS$),ADR(DS$)+
   LEN(DS$),7,21,28,1)
DY 1270 GOSUB 1470:POSITION 5,22:? "Sorte
   d Descending by Tax Owed":GOSUB 1500
IY 1280 REM
GW 1290 REM SECOND EXAMPLE:
XF 1310 ? "K":POSITION 10,10:? "Reading D
   ATA"
AX 1320 DS$=" ":DS$(220)=" ":DS$(2)=DS$
LR 1330 FOR I=1 TO 20:READ I$,L$
UC 1340 PS=(I-1)*11+1
XY 1350 DS$(PS,PS+LEN(I$))=I$
DL 1360 DS$(PS+8,PS+8+LEN(L$))=L$
JX 1370 NEXT I:GOSUB 1530:POSITION 8,22:?
    "Original Unsorted Data":GOSUB 1500
JA 1380 REM
CG 1390 REM CALL ONCE FOR EACH LANGUAGE
WT 1410 I$="ACTION":GOSUB 1560
VC 1420 I$="BASIC":GOSUB 1560
XA 1430 I$="ASSEMBLY":GOSUB 1560
DG 1440 I$="LOGO":GOSUB 1560:GOSUB 1530
KK 1450 POSITION 2,22:? "Data sorted Asce
   nding by BYTE size":GOSUB 1500
ZT 1460 GRAPHICS 0:POKE 710,145:END
RZ 1470 ? "K":POSITION 2,0:? " LAST   FI
   RST  INCOME   TAX OWED "
NY 1480 FOR I=1 TO 20:PS=(I-1)*28+1
AU 1490 ? DS$(PS,PS+6);" ";DS$(PS+7,PS+12
```

continued on next page

```
   );"  ";DS$(PS+13,PS+20);"      ";DS$(PS+
   21,PS+27):NEXT I:RETURN
FU 1500 POSITION 5,23:? " Press SPACE BAR
    to continue";:POKE 764,255
AR 1510 IF PEEK(764)<>33 THEN 1510
BT 1520 POKE 764,255:RETURN
SR 1530 ? "":POKE 82,9:POSITION 7,0:? "
   LANGUAGE             BYTES "
EJ 1540 FOR I=1 TO 20:PS=(I-1)*11+1
BX 1550 ? DS$(PS,PS+7);"          ";DS$(PS+
   8,PS+10):NEXT I:POKE 82,2:RETURN
ZQ 1560 FIRST=USR(ADR(FS$),ADR(DS$),ADR(I
   $),LEN(I$),0,11,LEN(DS$)/11)
QR 1570 LAST=PEEK(205)+256*PEEK(206)
LI 1580 A=USR(ADR(SN$),FIRST,LAST,3,8,11,
   0):RETURN
GE 1590 DATA MIKE,SMITH,50234.45,567.32
BX 1600 DATA KEVIN,PECK,89675.00,-700.13
XC 1610 DATA BETTY,HUNTER,23456.21,45.23
MO 1620 DATA SCOTT,JONES,43256.78,123.67
WW 1630 DATA BILL,SMITH,4567.89,-34.56
CR 1640 DATA KIRK,PECK,56709.23,56.45
VB 1650 DATA HERMAN,SMITH,10231.45,10.56
ES 1660 DATA JILL,JOHNSON,15678.32,-10.26
AJ 1670 DATA FRED,JAMES,11456.32,152.12
UM 1680 DATA BARNEY,HUNTER,34892.11,35.67
IJ 1690 DATA SUSAN,HUNT,8900.00,-156.90
QS 1700 DATA LOU,PECK,12754.23,-67.98
FD 1710 DATA JOSH,SMITH,34567.89,200.00
LH 1720 DATA MARY,JOHNSON,89900.45,500.00
GP 1730 DATA AMANDA,JAMES,44900.34,-34.00
HS 1740 DATA BOB,HUNT,56789.34,234.78
YU 1750 DATA JERRY,PECK,29000.00,56.90
ZG 1760 DATA MICKI,SMITH,32456.89,-90.56
EA 1770 DATA LEROY,JOHNSON,8765.12,-5.67
VQ 1780 DATA JIM,HUNTER,67543.12,345.67
RT 1790 DATA ACTION,67
TP 1800 DATA ACTION,98
OA 1810 DATA ACTION,54
AH 1820 DATA ACTION,109
LL 1830 DATA ACTION,23
TP 1840 DATA ACTION,100
JX 1850 DATA BASIC,120
CH 1860 DATA BASIC,23
NC 1870 DATA BASIC,115
JW 1880 DATA BASIC,97
FH 1890 DATA BASIC,54
SS 1900 DATA BASIC,178
HE 1910 DATA BASIC,67
PQ 1920 DATA ASSEMBLY,123
DI 1930 DATA ASSEMBLY,45
JT 1940 DATA ASSEMBLY,89
FC 1950 DATA ASSEMBLY,65
ST 1960 DATA LOGO,15
PP 1970 DATA LOGO,10
CZ 1980 DATA LOGO,154
QL 1990 DATA LOGO,20
XY 2000 DIM FS$(137)
XZ 2010 FS$="X)PTUhhNhMhWhUhhQh
   hXhh0hLhKMeXMfN1MQUPHDQPU8
   NUMeXT0FU"
KW 2020 FS$(81)="MeOMfNhPfPdKPPEL
   P8MeXM0FNUP:1MQUPhHDQPUPG"
CC 2030 DIM SN$(292)
HY 2040 SN$="XhhNhMhWhUhhKhh0eKXh
   hLhhaW8VeL0FSO1MI-PhMI.P
   I PHDXPqP"
FA 2050 SN$(81)="NUMeLTfUSO)b1TI-P
   fb1TI.PI PHDXPqQadbP"
UX 2060 SN$(134)=CHR$(34)
NZ 2070 SN$(135)="0VP(QEPp:08PGa\e
   bIP)eaP61MH1TMhTHDLPqQP&b
   PC0LPEa\ebI"
BD 2080 SN$(215)="P)eaPJTeLTUi
   UEWPTEUP"
SB 2090 SN$(249)=CHR$(155)
VV 2100 SN$(250)="MeLMNiNEPKME.P6
   SO1MQTP10-HDXPePo"
AF 2110 RETURN
```

LISTING 2

```
BN 10 REM NUMSORT.BAS
WI 20 REM BY KEVIN PECK
GD 30 REM (c) 1985,1988 ANTIC PUBLISHING
BP 35 REM (CREATES SN$ AND FS$ FOR LINES
   2010-2100 OF THE NUMSORT DEMO.)
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? " COMPLETED 
   "
NT 1000 DATA 599
HB 1010 DATA 050048049048032070083036061O
   342161690001701332081332121332131O4104
   133206104133205104133215104
DQ 1020 DATA 1332141041041332091041041332
   16104104133207104133204104133203024165
   205101216133205144002230206
DN 1030 DATA 1600001772052092142080202001
   96209208245056165206133213165205229216
   133212176002198213034155050
ZP 1040 DATA 0480500480320700830360400560
   49041061034024165205101207133205144002
   230206232208002230208228203
QC 1050 DATA 2080181652081972042080120561
   65205229216133205176002198206096165213
   240186160000177205209214208
KL 1060 DATA 2322001962092082452401990341
   55050048051048032068073077032083078036
   0400050057050041155050048052
PJ 1070 DATA 0480320830780360610342161041
   04133206104133205104133215104133214104
   104133203104104133207024101
RQ 1080 DATA 2031332161041041332041041041
   33225165215133001056165214229204133000
   176002198001164207162000177
MP 1090 DATA 2052010452080012321772052010
   46240009201032240005200196216208241132
   208024165034155050048053048
EZ 1100 DATA 0320830780360400560490410610
   34206133213165205101204133212144002230
   213164207169000133226177212
ZN 1110 DATA 2010452080022302261772122010
   46240009201032240005200196216208241132
   209165225133224228226240006
BG 1120 DATA 1440341550500480540480320830
   78036040049051052041061067072082036040
   051052041155050048055048032
YZ 1130 DATA 0830780360400490510530410610
   34176086208168165209197208240058144004
   176056208199165225133224024
SF 1140 DATA 1381012262010022080061690012
   29225133224165224208054160000177205072
   177212145205104145212200196
MJ 1150 DATA 2042082411652091332081662260
   24144028208192176204240069165225133224
   024138101226201002034155050
QV 1160 DATA 0480560480320830780360400500
   49053041061034208006169001229225133224
   165224208202024165212101204
SQ 1170 DATA 1332121652131050001332131972
   15208161165212197214208034155050048057
   048032083078036040050052057
HV 1180 DATA 0410610670720820360400490530
   53041155050049048048032083078036040050
   053048041061034024165205101
RS 1190 DATA 2041332051652061050001332061
   97001208188165205197000208182096164207
   177205209212240004176173144
TE 1200 DATA 1752001962162401922082390341
   55
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new challenges from an old favorite

PERFECTED PONG

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LISTING 1

Don't type the TYPO II Codes!

```
QV 10 REM PERFECTED PONG
PO 20 REM BY BOB AYIK
GD 30 REM (c) 1985,1988 ANTIC PUBLISHING
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
IG 70 FN$="D:PONG.EXE":REM THIS IS THE NA
   ME OF THE DISK FILE TO BE CREATED
RD 80 ? "Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "     AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? " COMPLETED 
   "
IJ 1000 DATA 3630
FJ 1010 DATA 255255000080251080032022083l
   6200018914108915700004823220824716911
   7141001002169000141000002162
XL 1020 DATA 0001690001570001281570001291
   5700013015700013115700013223220823816
   9012141197002141219002169000
DH 1030 DATA 1411980021412000021412160871
   6025520018519408915305212819201420824
   5160255200185209089153202130
NR 1040 DATA 1920102082451602552001850320
   9015307813219203520824516025520018522
   0089153126132192019208245160
WW 1050 DATA 2552001852400891530921311920
   0920824516025520018525008915313413119
   2005208245160255200185000090
UA 1060 DATA 1531211311920102082451602552
   0018501109015316413119200520824516025
   5200185017090153147131192008
MD 1070 DATA 2082451602552001850260901531
   8913119200520824516201803214608216200
   9160000032125082162018032161
JM 1080 DATA 0821620091600010321250821690
   0014121108703217608216000016900015300
   0051153000052153000053153000
GR 1090 DATA 0541530000552002082381411930
   8725208024708116025520018513809015307
   4052192022208245160255200185
VI 1100 DATA 1610901530740531920222082451
   6025520018518409015307405419202220824
   5160255200185209090153074055
VL 1110 DATA 1920222082451602551690282001
   5307405119201620824816001920015307405
   1192022208248162000169132160
VD 1120 DATA 0051572340900241050022322240
   1224000813620824202410500620823516900
   0157234090169000141048002169
WG 1130 DATA 0481410490021731900871410470
   0217321608714119800216900716208216020
   4032092228169192141014212169
PD 1140 DATA 0171411110021690991410012081
   6912114100220816914314100320816907714
   1000208169001141008208141009
YM 1150 DATA 2081410102081410112081690481
   4100721216908514101220816917214100520
   8169062141047002169003141029
RW 1160 DATA 2081692551412520021692511330
   2016900814103120817325200220125524003
   8201028208014173211087073001
KM 1170 DATA 1412110870321760820762540811
   7321608702410501614121608724808124308
   2141198002141200002169255141
QC 1180 DATA 2520021730312080410022080372
   3819208917319208920100620800516900014
   1192089032109082142190087032
IR 1190 DATA 1460821731900870741701600000
   3212508203219508217303120804100420803
   7238193089173193089201006208
HR 1200 DATA 0051690001411930890321090821
   4219008703216108217319008707417016000
   1032125082032195082173031208
NY 1210 DATA 0410012400030762090811690641
   4101421207621908316200014119008702410
   9190087232224005208247170096
CZ 1220 DATA 1891040901532230872321891040
   9015322508723218910409015322108709616
   0255200189068090153174131232
LN 1230 DATA 1920052082440961602552001890
   6809015320413123219200520824409601001
   0010170160255200189122090153
VY 1240 DATA 2281312321920072082440961692
   2513302016502020825209617319308720806
   3160000185234090056233002201
UK 1250 DATA 0181760021692521412330901690
   1620523309024000702410501620824624001
   2206233090206244082239083233
WN 1260 DATA 0902062330902062330901732330
   9015323409020019201220820416900013307
   7169005141193087206193087076
UH 1270 DATA 0982281620961690120320862281
   6209616900315706600316908715706900316
   9182157068003169012157074003
IS 1280 DATA 1690051570750030320862281730
   4700214119008716900014104700216900016
   0003032183083169079133085169
PE 1290 DATA 0001330861690031330841620961
   6901715706600316900314125100203208622
   8169000160045032183083169079
NQ 1300 DATA 1330851690001330861690451330
   8416209616901715706600316900314125100
   2032086228169039141189087169
DF 1310 DATA 0041411880871731890871721880
   8703218308323818808723818808717318808
   7201046208234173048002141186
QK 1320 DATA 0871730490021411870870961330
   8515213308416209616900915706600316908
   7157069003169185157068003169
ZV 1330 DATA 0011570720031690001570730030
   3208622809617304700214119008716900014
   1047002173186087141048002173
IO 1340 DATA 1870871412400832350840490021
   7319008714104700216906414100721216905
   4141000208169065141001208141
BY 1350 DATA 2020871691981410022081690681
   3312916907013313316906913313116912813
   3128133132133130169014141193
ZK 1360 DATA 0021690001410082081410092081
   4101020816900014100520816900114111100
   2169000162000157000068157000
BD 1370 DATA 0691570000070157000071232208
   2411692401600001451281451322001920182
   08247160000169224145130200192
PX 1380 DATA 0042082491690021410292081690
   6214104700216900314101521016900014100
   8210169120141008210169007162
DS 1390 DATA 1121600000320922281692271331
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continued on next page

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   52169087133153169013133154169088133155
   169055133156169088133157169
EV 1400 DATA 09713315816908813315916913913
   316016908813316116918113316216908813
   3163169223133164169088133165
SD 1410 DATA 16900913316616908913316717321
   608714120000205610500414119600214119
   7002105007141198002169154141
MP 1420 DATA 19200214119400216925514125200
   216923608423108500014121308714121408
   7032036087173211087208014160
BX 1430 DATA 00016200003216608616000116200
   003216608603203108617321808714120008
   7173220087141192087173222087
FY 1440 DATA 14120608716900114119908716200
   003205608617320908720800716900014100
   5210133077174210087048006189
PF 1450 DATA 08308914100121017319708724000
   303214508517319608724000303220908517
   3211087240212173252002201255
UP 1460 DATA 24020520117520800816900114121
   208707616008703203108617321908714119
   2087173217087141200087240012
HH 1470 DATA 17322008714119208717321808714
   120008716900114120108716925514125200
   2056176151169000141197087141
HO 1480 DATA 19908717321108720805023821308
   716200114221208703206708717421308716
   0000032166086162001032067087
FY 1490 DATA 03203108617321708714120008717
   321908714119208717322108714120608716
   2001032056086096169000141196
SC 1500 DATA 08716900114119908717321108720
   806223821408716900114121208723208522
   7086173214087240005162000032
OE 1510 DATA 06708717421408716000103216608
   617321408724000516200003206708703203
   1086173218087141200087173220
IF 1520 DATA 08714119208717322208714120608
   716200003205608609617322308714121708
   7173224087141218087173225087
FI 1530 DATA 14121908717322608714122008709
   616900003201311422400124000616906516
   00002400004169188160002141202
CC 1540 DATA 08714100120817301021004101514
   120108716925114119308717319308720802
   0169251141193087185192002056
ZS 1550 DATA 23300220114220800216915415319
   200217300021122400124000604100420822
   02400004041008208214169154153
CH 1560 DATA 19200216900014121208716900013
   301914120508714120408714119308714119
   4087141195087096140215087224
DY 1570 DATA 01014404313805623301017016010
   717321508724001215202410500416816900
   4141190087208005169008141190
CC 1580 DATA 08717319008714508815202410502
   016819220514424214219008713801001002
   4109190087170160228086185087
UA 1590 DATA 10817321508724000515202410500
   416816900014119008718909108914119108
   7173215087240003078191087173
PE 1600 DATA 19108714508815202410502016823
   223819008717319008720100514422116901
   4205213087144081205214087144
EO 1610 DATA 07609616010716900014508820014
   508815202410500316816900014508820014
   5088152024105015168192205144
BE 1620 DATA 22809618919600214119008716000
   216900014100121016924513302016907015
   7196002165020208252173190087
TQ 1630 DATA 15719600216924513302016502020
   825213620822609616900114121208717320
   0002141198002141192002141194
DM 1640 DATA 00217325200220125520802517300
   021104100824000917300021104100424000
   2208233173190087141200002076
FI 1650 DATA 20208416901214119700217304700
   214119008716900014102920814104700207
   62270800083058155067196087199
LP 1660 DATA 08700000000000020108720108700
   020308720308700020908721108700025500
   0227087222088000001000001000
HA 1670 DATA 00100100100000100100100100100
   100100100100100100100200100100100100
   1001002001002001002001002001
QW 1680 DATA 00200100300100300100000100000
   100000100000100100100000100100100100
   1001001001001001001001001002
OI 1690 DATA 00100200100200100200100200100
   300100200100200100300100000100000100
   0001000001000001001001000001
DP 1700 DATA 00100100100100100100200100100

   01001001002001001001002001002001002001
   0020010020010020010000010000
FW 1710 DATA 00100100100100100100100100100
   10010010010010010010020010010010020010
   02001001001002001001001002001
HX 1720 DATA 00300100200100300100300100000
   100000100000100000100000100000100100
   1000001001001001001001001001
SC 1730 DATA 00100100100200100200100200100
   200100200100200100200100200100000100
   0001000001000001001001001001
TC 1740 DATA 00100100100100100100100100200
   100100100200100200100200100200100200
   1002001002001002001003001223
JY 1750 DATA 08821808900000100000100000100
   100100000100000100000100100100100100
   1001001001002001001001001001
XJ 1760 DATA 00100100200100200100200100300
   100300100200100000100100100100100000
   1001001001001001001001001001
GL 1770 DATA 00100100100100100100100200100
   200100200100200100200100200100200100
   2001003001003004006005004003
LF 1780 DATA 00200100100200300400500600400
   300700600500400400300300300300300300
   4004005006007000033035037039
DP 1790 DATA 04104304516813613613616800800
   800080008168008168128168168008168008
   168136136168008008168128168
VC 1800 DATA 00816812812816813616816800800
   800080081681361681361681681361680080
   08112112112066000128002002002
KC 1810 DATA 01101101101113913913913913913
   913913913913913901101113901101101101
   1011011002002002002002002
ZG 1820 DATA 00200200200200200200200206500
   004800300303304605204103500000004811
   4101115101110116115098121000
VI 1830 DATA 03411109800003312110521908921
   409010704811410111511500017918016117
   8180000116111000098101103105
GH 1840 DATA 11004410110211600005110710510
   810817916517216516318000501051031041
   16000051107105108108175176180
TR 1850 DATA 16917517404810809712100045111
   100101165179163161176165048114101115
   115000097110121000107101121
UO 1860 DATA 00011611100009910409710103101
   000115099114101101110000099111108111
   114000034097098101000000035
OI 1870 DATA 10410510810000005210110111000
   000003310011710811605110111010511111
   4051112105114105116001003001
YB 1880 DATA 00100200200100100400200100500
   300100600400100700000003909710910100
   0000048114097099116105099101
YF 1890 DATA 24025225420719519519519520725
   525425224019219219219219219219219219
   2192024060126231195195195195
SF 1900 DATA 19519519519519519519519519519
   519523112606002419519519522722722722
   7227243211211219219203203207
ME 1910 DATA 19919919919919919519519519502
   406012623119519221509023209019219219
   2192192192207207195195195195
XG 1920 DATA 19523112606002425500011225111
   207213807215207216900003202511217311
   2002032023114133128169240032
VH 1930 DATA 02511224001016000014512820019
   201820824909616900003205511217311300
   2032023114133132169240032055
EG 1940 DATA 11224001016000014513220019201
   820824909617321208724000307610611317
   3192087205193087240003076106
SJ 1950 DATA 11316900014119308716900003201
   311403203611416900014119408720619508
   7016005169007141195087173195
AM 1960 DATA 08701014106500616818515200013
   316818515300013316917320108701016817
   3198087240009165130024113168
NC 1970 DATA 13313020800716513005624116813
   313020017319908724001417320208702411
   3168141202087141001208208012
KV 1980 DATA 17320208705624116814120208714
   100120817320208720102017600323819608
   7201235144003238197087032070
DC 1990 DATA 11423819408703221711417319408
   720520008714413617320208720105914400
   6201195176064208120201051144
JV 2000 DATA 11616512803214311131920012081
   071690001411932521122471130871731990
   87073001240095169001141199087
MP 2010 DATA 17320008714121708717319208714
   121908717321808714120008717322008714
   1192087173222087141206087208
TN 2020 DATA 05820120317605416513203214311
   319200120804517319908707300120803816
   9000141193087141199087173200
TA 2030 DATA 08714121808717319208714122008
   717321708714120008717322108714120608
   7
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   | 1732190871411920871692240 32
DA | 2040 DATA 0131142400002381930872062090
   | 87173210087048003206210087173252002201
   | 175208008169001141212087076
NF | 2050 DATA 1600871041681041701040760982
   | 28160000024233003197130176116024105020
   | 197130144109032108114200169
LW | 2060 DATA 0081412100871692001410002101
   | 69045141001210173205087201001208036206
   | 205087206192087206220087206
BW | 2070 DATA 2190871732200872010012080021
   | 69001141220087173219087201001208002169
   | 001141219087173204087201001
FH | 2080 DATA 2080402062040872382000872382
   | 18087238217087173218087205222087144003
   | 248113227114173222087141218
LV | 2090 DATA 0871732170872052210871440031
   | 73221087141217087096160000145130200192
   | 004208249096201048176002169
NX | 2100 DATA 0482011951440021691940961732
   | 00087205206087176025165019201005144019
   | 169000133019173192087201002
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FK | 2110 DATA 1440052382050872080032382040
   | 87096165130201048176007169001141198087
   | 208009201208144020169000141
PH | 2120 DATA 1980871690301410042101690431
   | 41005210169002141209087096162008056229
   | 130201009144043056233010170
PF | 2130 DATA 1410650061731980870410012080
   | 12024173201087125059089141201087208010
   | 024173201087253075089141201
LA | 2140 DATA 0871690001411980872400351701
   | 73198087073001208012173201087024125051
   | 089141201087208010173201087
PQ | 2150 DATA 0562530670891412010871690011
   | 41198087173201087016007169000141201087
   | 208009201021144005169020141
MB | 2160 DATA 2010870961732010872010111440
   | 03238194087096000117040117072152072238
   | 232090172232090185234090141
WX | 2170 DATA 0102121410182081410192081410
   | 20208141021208141025208208005169255141
   | 232090104168104064224002225
LI | 2180 DATA 002000080
```

keep on computing while you print!

ANTIC SPOOLER

Article on page 22

LISTING 1

Don't type the TYPO II Codes!

```
IX | 10 REM PRINTER SPOOLER
KE | 20 REM BY GLENN K. SMITH
GT | 30 REM (c) 1985-1988 ANTIC PUBLISHING
EV | 40 REM (LINES 10-250 MAY BE USED WITH
   | OTHER BASIC LOADERS IN THIS ISSUE.
IJ | 50 REM CHANGE LINE 70 AS NECESSARY.)
PR | 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   | EEK(10592):POKE 10592,255
CU | 70 FN$="D:SPOOLER.OBJ":REM THIS IS THE
   |  NAME OF THE DISK FILE TO BE CREATED
RD | 80 ? "Disk or Cassette?";:POKE 764,25
   | 5
PY | 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   | 58) THEN 90
TH | 100 IF PEEK(764)=18 THEN FN$="C:"
VB | 110 POKE 764,255:GRAPHICS 0:? "      AN
   | TIC'S GENERIC BASIC LOADER"
MY | 120 ? ,"BY CHARLES JACKSON"
KB | 130 POKE 10592,DPL:TRAP 200
PU | 140 ? :? :? "Creating ";FN$:? "...Plea
   | se stand by."
LW | 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   | C=1
BQ | 160 AR$="":READ AR$
YC | 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   | 2,255
DM | 180 LM=LM-1:POSITION 10,10:? "(Countdo
   | wn...T-";INT(LM/10);")     "
BK | 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   | 1:NEXT X:GOTO 160
MM | 200 IF PEEK(195)=5 THEN ? :? :? "TOO
   | MANY DATA LINES!":? "CANNOT CREATE FIL
   | E!":END
CM | 210 IF C<LN+1 THEN ? :? "TOO FEW DATA
   |  LINES!":? "CANNOT CREATE FILE!":END
UQ | 220 IF FN$="C:" THEN ? :? " Prepare ca
   | ssette, press [RETURN]"
AR | 230 OPEN #1,8,0,FN$
PV | 240 POKE 766,1:? #1;A$;:POKE 766,0
AL | 250 CLOSE #1:GRAPHICS 0:? "COMPLETED"
HK | 1000 DATA 631
OX | 1010 DATA 2552551740681690691722320022
   | 00132205160000132204132206169069133207
   | 174232002177206201102240012
SL | 1020 DATA 2010692400162010702400112010
   | 71208010138024105033208004232232232138
   | 145204230204230206208004230
UX | 1030 DATA 2052302071652072010712082071
   | 65206201016208201174232002232232142255
   | 068076177070000000000000000
GB | 1040 DATA 0000000000100000000000001410
   | 09069142010069173011069013012069240023
   | 173054069205139069238015173
AU | 1050 DATA 0550692051400692080071690001
   | 41008069240233173009069141176070238011
   | 069208003238012069238054069
YL | 1060 DATA 2080032380550691730550692011
   | 02208017173054069201176208010169176162
   | 070141054069142055069174010
ZF | 1070 DATA 0691600011400080690961730080
   | 69240006206008069076098228173007069016
   | 003076215069173011069013012
WW | 1080 DATA 0692080030760000701740060691
   | 73176070157192003168238139069208003238
   | 140069173140069201102208017
KB | 1090 DATA 1731390692011762080101691761
   | 62170069165070070141139069142140069173
   | 011069208003206012069206011
KT | 1100 DATA 0692321420060692240402400141
   | 92155208056169032157192003232224040208
   | 248160146076002070162011189
RY | 1110 DATA 0000031570200702020162471620
   | 1118900807015700003202016247232142006
   | 069032089228162011189020070
QN | 1120 DATA 1570000320201624704416000011
   | 40007069076098228064001087128192003030
   | 000040000078000000000000000
BL | 1130 DATA 0000000000000000000000001730
   | 88070174089070133010134011173091070174
   | 092070133012134013173000069
OD | 1140 DATA 1740010691412310021422320021
   | 73004069174005069141027003142028003172
   | 002069174003069169007032092
XC | 1150 DATA 2280760870702550120001690321
   | 62070133010134011169176162070141054069
   | 142055069141139069142140069
YD | 1160 DATA 1691761621021412310021422320
   | 02169161162070141027003142028003160000
   | 140011069140012069140006069
AL | 1170 DATA 2001400070691601051620691690
   | 07076092228000000000000000166070016071
   | 000120690000000000000000000
QT | 1180 DATA 0000001730270031740280031332
   | 04134205141004069142005069160000177204
   | 153161070200192006208246160
MN | 1190 DATA 0081772041531610702001920152
   | 08246165012166013141091070142092070165
   | 010166011141088070142089070
OS | 1200 DATA 1690901620701330121340131732
   | 31002174232002141000069142001069173036
   | 002174037002141002069142003
MZ | 1210 DATA 0690760930700002240022250021
   | 74068
```

BASIC Concentration 8-bit memory game

RECALL

Article on page 33

LISTING 1

Don't type the TYPO II Codes!

```
DA 10 REM RECALL
GX 20 REM BY BARRY KOLBE
QH 30 REM (c)1988, ANTIC PUBLISHING
TC 40 DEBUG=PEEK(53279)=5
TP 100 GOSUB 1610
XX 110 GOSUB 890:GRAPHICS 2:POKE 756,CHSE
   T:POKE 559,46:POKE 752,1:GOSUB 525
BE 120 DL=PEEK(560)+256*PEEK(561)+14
NF 130 POKE DL,PEEK(DL)+128:POKE 513,INT(
   ADR(DLI$)/256):POKE 512,ADR(DLI$)-256*
   PEEK(513):POKE 54286,192
KO 140 X=1:Y=0:POSITION X,Y:? #6;" 1  2
   3  4  5  6";:Y=Y+2
ZS 150 POSITION X,Y:? #6;" 7  8  9 10 11
   12";:Y=Y+2
NL 160 POSITION X,Y:? #6;"13 14 15 16 17
   18";:Y=Y+2
ZM 170 POSITION X,Y:? #6;"19 20 21 22 23
   24";:Y=Y+2
SJ 180 POSITION X,Y:? #6;"25 26 27 28 29
   30";
XL 190 PLAYER=0:IF OPP=1 THEN PLAYER=1:X=
   USR(ADR(MOVE$),ADR(PDEF$),PL0,YP):POKE
   53248,XP
BW 195 POKE 704,96*PLAYER+30
GK 200 POKE 656,0:POKE 657,1:? "Pick two
   numbers CONTROL G to guess";:POKE 656,
   1:POKE 657,10
RN 210 ? "Current player ";PLAYER+1:IF XG
   =1 THEN GOSUB 575
VV 211 GOSUB 525
UJ 220 POKE 656,2:POKE 657,5:? "SCORE  1:
   ";SC(1);:POKE 657,25:? "2: ";SC(2)
SA 230 IF PEEK(764)=189 THEN 970
DG 240 IF OPP=1 AND PLAYER THEN GOSUB 112
   0:XP=TX:YP=TY:GOTO 260
EP 250 GOSUB 430:GOSUB 1060
FU 260 F=((XP-52)/24)+1+((YP-14)/16)*6
OC 270 IF DONE(F)=1 THEN 230
NC 280 CG$(F,F)=MATCH$(F,F)
MN 290 SY=INT((F-1)/6):SX=F-SY*6
VZ 300 POSITION 1+SX*3-3,SY*2:? #6;" ";MA
   TCH$(F,F)
FS 310 IF OPP=1 AND PLAYER THEN GOSUB 135
   0:XP=TX:YP=TY:GOTO 330
EK 320 GOSUB 430:GOSUB 1060
IC 330 S=((XP-52)/24)+1+((YP-14)/16)*6
NP 340 SY1=INT((S-1)/6):SX1=S-SY1*6
GK 350 IF F=S THEN 310
TP 360 IF DONE(S)=1 THEN 310
TB 370 CG$(S,S)=MATCH$(S,S)
BU 380 POSITION 1+SX1*3-3,SY1*2:? #6;" ";
   MATCH$(S,S)
AU 390 IF MATCH$(F,F)=MATCH$(S,S) THEN DO
   NE(F)=1:DONE(S)=1:CG$(F,F)=" ":CG$(S,S
   )=" ":GOTO 720
BY 400 GOSUB 1030:PLAYER=PLAYER+1:XG=1:IF
    PLAYER=2 THEN PLAYER=0
ZL 410 GOSUB 530:GOSUB 550:GOTO 200
LF 420 REM STICK MOVE
CK 430 X=USR(ADR(MOVE$),ADR(PDEF$),PL0,YP
   ):POKE 53248,XP
RK 440 FOR I=1 TO 50:NEXT I
OV 450 IF PEEK(764)=189 THEN GOTO 970
TZ 460 ST=PEEK(632+PLAYER):IF ST=14 THEN
   YP=YP-16:IF YP<=0 THEN YP=78
UP 470 IF ST=13 THEN YP=YP+16:IF YP>=94 T
   HEN YP=14
AP 480 IF ST=11 THEN XP=XP-24:IF XP<=44 T
   HEN XP=172
KX 490 IF ST=7 THEN XP=XP+24:IF XP>=188 T
   HEN XP=52
SU 500 IF PEEK(644+PLAYER)=1 THEN 430
VV 510 GOSUB 525
ZF 520 RETURN
DU 525 POKE 77,0:IF  NOT (DEBUG) THEN POK
   E 16,112:POKE 53774,112
ZX 526 RETURN
SY 530 M$=STR$(F):IF F<10 THEN M$="  ":M$
   (2)=STR$(F)
NZ 540 POSITION 1+SX*3-3,SY*2:? #6;M$;:RE
   TURN
HC 550 M$=STR$(S):IF S<10 THEN M$="  ":M$
   (2)=STR$(S)
OV 560 POSITION 1+SX1*3-3,SY1*2:? #6;M$:R
   ETURN
BX 570 GOSUB 530:GOTO 200
NS 575 FOR XG=14 TO 0 STEP -1:SOUND 0,50,
   14,XG:NEXT XG:POKE 704,96*PLAYER+30:RE
   TURN
RG 580 REM
VC 590 REM RESTART
WU 610 GOSUB 1850
DC 620 MATCH$=BL$:CG$=BL$
JK 630 FOR I=1 TO 30:RN(I)=I:NEXT I
KV 640 FOR I=1 TO 30:X=INT(RND(0)*30)+1:B
   =RN(I):RN(I)=RN(X):RN(X)=B:NEXT I
CW 650 FOR I=1 TO 15:MATCH$(RN(I),RN(I))=
   CHR$(I+162):MATCH$(RN(15+I),RN(15+I))=
   CHR$(I+162)
YW 660 IF I>11 THEN MATCH$(RN(I),RN(I))=C
   HR$(175+I):MATCH$(RN(15+I),RN(15+I))=C
   HR$(I+175)
GK 670 NEXT I
YU 680 FOR I=1 TO 30:DONE(I)=0:NEXT I:XP=
   52:YP=14:SC(1)=0:SC(2)=SC(1):RETURN
RJ 690 REM
NF 700 REM WINNING
CI 720 GOSUB 1040:POSITION 1+SX*3-3,SY*2:
   ? #6;" ";T$(F,F);:POSITION 1+SX1*3-3,S
   Y1*2:? #6;" ";T$(S,S);
WZ 730 SC(PLAYER+1)=SC(PLAYER+1)+1
NP 740 IF SC(1)+SC(2)<>15 THEN 200
KM 750 POKE 54286,64:FOR I=10 TO 250 STEP
    10:POKE 710,I:POKE 712,250-I:SOUND 0,
   150+I,10,8
HG 760 FOR J=1 TO 15:NEXT J:SOUND 0,0,0,0
   :NEXT I
AR 770 POKE 53248,0:GRAPHICS 0:POKE 752,1
   :POSITION 4,4:? "The Winning player is
    ";
QK 780 PLAYER=1:IF SC(2)>SC(1) THEN PLAYE
   R=2
RB 790 ? PLAYER:POSITION 4,8:? "THE PUZZL
   E IS ":POSITION 4,10:? A$
TT 800 POSITION 4,12:? "SCORES  1: ";SC(1
   );"    2: ";SC(2)
PE 810 POSITION 4,16:? "Press START to pl
   ay again"
VE 820 POSITION 4,18:? "Press OPTION to q
   uit"
BN 830 IF PEEK(53279)=6 THEN 110
MT 840 IF PEEK(53279)=3 THEN GRAPHICS 0:E
   ND
PW 850 GOTO 830
RF 860 REM
NH 870 REM INTRO
EC 890 GRAPHICS 17:POKE 708,30:POKE 709,2
   02:POKE 710,152:POKE 711,14:POKE 712,5
   0
GA 895 POSITION 4,1:? #6;"■ RECALL ■":OPP
   =2
RM 900 GOSUB 610:GOSUB 950
PD 910 POSITION 2,15:? #6;"select to choo
   se":POSITION 2,17:? #6;"start to begin
   "
IY 920 I=PEEK(53279):IF I=6 THEN RETURN
HK 930 IF I=5 THEN GOSUB 1050:OPP=OPP+1:I
   F OPP>2 THEN OPP=1
LL 940 GOSUB 950:GOTO 920
ZA 950 IF OPP=1 THEN POSITION 2,7:? #6;"
   TWO PLAYER   ":POSITION 2,9:? #6;"> ON
   E PLAYER <":RETURN
UM 960 POSITION 2,7:? #6;"> TWO PLAYER <"
   :POSITION 2,9:? #6;"  ONE PLAYER   ":RE
   TURN
LL 970 REM GUESS
VH 980 POKE 752,0:POKE 764,255:? "■":POKE
    656,1:POKE 657,2:? "GUESS ";:POP
UG 990 POKE 656,2:INPUT R$:IF
   R$=A$ THEN ? "CORRECT":GOTO 1020
PL 1000 PLAYER=PLAYER+1:IF PLAYER=2 THEN
   PLAYER=0
WO 1010 POKE 752,1:? "■":GOTO 200
OY 1020 SC(PLAYER+1)=SC(PLAYER+1)+15-(SC(
   1)+SC(2)):GOTO 750
```

```
ID 1030 REM DELAY
UK 1040 FOR I=1 TO 200:NEXT I:GOSUB 525:R
   ETURN
RS 1050 REM SOUND
EP 1060 SOUND 0,200,10,8:FOR I=1 TO 50:NE
   XT I:SOUND 0,0,0,0:RETURN
XK 1070 IF PEEK(764)=255 THEN 1070
CB 1080 POKE 764,255:RETURN
IV 1090 REM DELAY
ZA 1100 FOR I=1 TO 20:NEXT I:RETURN
IB 1110 REM
GH 1120 REM COMPUTER
UV 1140 POKE 1791,0:FOR I=1 TO 29:FOR J=I
   +1 TO 30
MJ 1150 IF CG$(I,I)=" " THEN 1180
GD 1160 IF CG$(J,J)=CG$(I,I) THEN CF=I:CS
   =J:POKE 1791,1:GOTO 1190
FX 1170 NEXT J
OK 1180 NEXT I:GOTO 1250
QL 1190 YF=INT((CF-1)/6):XF=CF-YF*6-1:GOT
   O 1270
NH 1200 POKE 1791,0:FOR I=1 TO 30:IF DONE
   (I)=0 THEN CF=I:GOTO 1220
NR 1210 NEXT I:GOTO 1250
YI 1220 FOR J=30 TO I+1 STEP -1:IF DONE(J
   )=0 THEN CS=J:POKE 1791,1:GOTO 1190
FN 1230 NEXT J
IF 1240 REM RANDOM MOVE
DW 1250 XF=INT(RND(0)*6):YF=INT(RND(0)*5)
   :CF=YF*6+XF:IF  NOT DONE(CF) AND SC(1)
   +SC(2)<8 THEN 1280
QA 1260 IF DONE(CF) THEN 1200
BD 1270 REM MOVE
CS 1280 TX=52+24*XF:TY=16*YF+14
MB 1290 IF TX=XP THEN 1310
LJ 1300 FOR J=XP TO TX STEP SGN(TX-XP)*24
   :POKE 53248,J:GOSUB 1090:NEXT J
FM 1310 IF YP=TY THEN RETURN
BZ 1320 FOR J=YP TO TY STEP SGN(TY-YP)*16
   :GOSUB 1330:GOSUB 1090:NEXT J:RETURN
AI 1330 X=USR(ADR(MOVE$),ADR(PDEF$),PL0,J
   ):RETURN
IO 1340 REM
GF 1350 REM COMPUTER 2ND MOVE
FB 1370 IF PEEK(1791)=1 THEN CF=CS:GOTO 1
   190
FD 1380 FOR I=1 TO 30
IM 1390 IF I=F THEN 1410
YV 1400 IF CG$(I,I)=MATCH$(F,F) THEN CF=I
   :GOTO 1190
FA 1410 NEXT I
QN 1420 GOTO 1250
MV 1430 DATA 4,28,52,116,12,255,126,60
RI 1440 DATA 0,0,120,100,255,255,102,0
DO 1450 DATA 0,126,16,158,249,31,0,0
VU 1460 DATA 24,60,126,255,153,153,255,0
FL 1470 DATA 24,60,126,255,255,24,24,24
FH 1480 DATA 16,56,40,56,56,56,124,186
HB 1490 DATA 66,36,24,126,66,66,66,126
BK 1500 DATA 0,54,127,127,62,28,8,0
ZG 1510 DATA 0,24,60,126,126,60,24,0
BN 1520 DATA 8,12,79,159,188,248,124,0
WV 1530 DATA 126,66,66,126,126,126,126,0
QX 1540 DATA 0,0,1,10,28,40,64,0
KR 1550 DATA 56,108,124,56,48,56,48,0
CG 1560 DATA 60,60,24,60,102,66,102,60
NV 1570 DATA 0,60,36,255,255,255,255,255
JE 1580 REM
BD 1590 REM INIT
DT 1610 GRAPHICS 18:POSITION 7,2:? #6;"RE
   CALL":POSITION 3,4:? #6;"by barry kolb
   e"
VX 1620 POSITION 5,6:? #6;"please wait":G
   OSUB 525
DX 1630 DIM BL$(30),M$(2),SC(2),A$(30),R$
   (30),T$(30),MATCH$(30),RN(30),CG$(30),
   CMOV$(35),MOVE$(60),PDEF$(12)
BV 1640 DIM DONE(30),DLI$(20)
VQ 1650 DLI$="H)♥▬NT▬▬P)N▬▬Phe"
ZS 1670 BL$="
      ":POKE 752,1:SC(1)=0:SC(2)=0
IJ 1680 CMOV$="hhLh)◆N)♥MK▬J▬♥1MrKHPy
   fLfNJ*P◆"
JK 1710 POKE 752,1:PMBASE=PEEK(106)-16:PL
   0=PMBASE*256+512
UQ 1720 PDEF$="KK▬▬▬▬▬▬▬▬KK"
VD 1740 POKE 623,1:POKE 54279,PMBASE:POKE
    53277,3:POKE 559,46:POKE 704,78:POKE
   53256,3
UU 1750 XP=52:YP=14:POKE 705,148:POKE 706
   ,148
PH 1760 MOVE$="hhLhKhNhMjhhT)♥(rM/P♠
   ▬♥JUSU1KSTrMfTfUZUIJPn◆"
KG 1790 CHSET=PEEK(106)-20:MYCH=CHSET*256
   :RESTORE 1430
XA 1800 X=USR(ADR(CMOV$),MYCH)
QT 1810 FOR I=3 TO 13:FOR J=0 TO 7:READ B
OO 1820 POKE MYCH+I*8+J,B:NEXT J:NEXT I
YY 1830 FOR I=27 TO 30:FOR J=0 TO 7:READ
   B
BN 1840 POKE MYCH+I*8+J,B:NEXT J:NEXT I:P
   OKE 756,CHSET:RETURN
RP 1850 I=INT(RND(0)*10):RESTORE 1900+I*1
   0
ZL 1860 READ A$:T$=BL$(1,30):A=LEN(A$)-1:
   X=INT((30-A)/2):X=X+(X=0):T$(X,X+A)=A$
OT 1870 FOR I=X TO X+A:T=ASC(T$(I,I)):T=T
   +160:IF T=192 THEN 1890
UI 1880 T$(I,I)=CHR$(T)
TR 1890 NEXT I:XP=52:YP=14:RETURN
VW 1900 DATA A STITCH IN TIME SAVES NINE
LP 1910 DATA THE MERCHANT OF VENICE
QV 1920 DATA ROSES ARE RED VIOLETS ARE BL
   UE
QW 1930 DATA CHARGE OF THE LIGHT BRIGADE
BU 1940 DATA THE HOUND OF THE BASKERVILLE
   S
WL 1950 DATA ANTIC THE ATARI RESOURCE
TX 1960 DATA HE WHO LAUGHS LAST LAUGHS BE
   ST
MD 1970 DATA THE WALRUS AND THE CARPENTER
ON 1980 DATA DECLARATION OF INDEPENDENCE
NY 1990 DATA ALEXANDER THE GREAT
```

LISTING 2

```
SF 10 REM RECALL, LISTING 2
GX 20 REM BY BARRY KOLBE
GD 30 REM (c) 1985,1988 ANTIC PUBLISHING
IK 35 REM (CREATES LINES 1650, 1680, 1720
    AND 1760 FOR RECALL.BAS)
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? " COMPLETED 
   "
JE 1000 DATA 166
HS 1010 DATA 0490540530480320680760730360
   6103407216900014101021214102420816901
   0141023208104064034155049054
BE 1020 DATA 056048032067077079086036061
   0341041041332041041692241332061690001
   33205133203162003160000177205
HM 1030 DATA 145203200208249230204230206
   2020162400960341550490550500480320800
   68069070036061034254254130130
AN 1040 DATA 130130130130130254254034
   1550490550540480320770790860690360610
   34104104133204104133203104133
UJ 1050 DATA 206104133205234104104133212
   1690001681452051362082511600001322131
   64213177203164212145205230212
VF 1060 DATA 230213165213201012208238096
   034155
```

Crazy Chicken Barrage

Article on page 51

A

```
' ------------------------------------
' BARRAGE
' By Stephen Evermann  & Paul Pratt
' (c)1988, Antic Publishing Inc.
'
If Xbios(4)<>0       !CHECK RESOLUTION
  Alert 1,"  |      B A R R A G E    | | REQUIRES  LOW  RESOLUTION",1,"SORRY",B
  End
Endif
Scr_mem=Lpeek(1102)            !Get address of screen memory
Dim Obj$(9),Egg$(6),Eggx(10),Eggy(10),Eggtype$(10),Egg_ofs(10)
Dim Speed(10),Pal(15)
@Fix_colors(True)
Graphmode 1
@In_hi_score
@Assign_objects
For Numegg=0 To 9
  @New_egg(Numegg)             !Initialize eggs
Next Numegg
@Talk_screen                   !Opening screen
Boyx=112                       !Initialize boy's position
Boyy=166
Play=True
' Key=&HFFFC02      pause removed
@Do_color
@Talk
Level=0
Numegg=0
Total_eggs=0
Eggs_avaible=15
Lives=3
Extra=0
' Score=0
Bonus_level=1
While Play=True
  ' Score=Temp_score
  @Screen
  Dance=False
  Play=True
  Dead=False
  Hidem
  @Score
  @Heals
  @Main
  If Score>Hi_score
    Hi_score=Score
  Endif
  @Talk
Wend
If Score>Hi_score
  Hi_score=Score
```

B

```
Endif
Setcolor 0,7,7,7
Open "R",#3,"HI_SCORE.EGG"
Write #3,Hi_score
Close #3
@Fix_colors(False)
Showm
End
' ----------------------------------------------
Procedure Main
  @New_egg(1)
  While Play=True
    Mouse Mx,My,Btn
    @Walk
   If Btn<>0
     Play=False
     @Egg_clear
     @Heals
   Endif
   @Egg_drop
   If Dance=True
     Dance=False
     @Heals
   Endif
   If Steady>4                !For smooth movement
     Steady=0
     Put Boyx,Boyy,Obj$(1),3
     Vsync
     Wave 0,0,0,0
     Dead=False
   Endif
   Inc Steady
  Wend
Return
' -----------------------------------------------------------
Procedure Walk
  If Mx<305 And Mx<>Boyx
    If Mx<>Boyx
      Obj=3
    Else
      Obj=2
    Endif
    Put Boyx,Boyy,Obj$(0),3
    Put Mx,Boyy,Obj$(Obj),3
    Vsync
    Boyx=Mx
    Wave 8,5,7,3
  Else
    Pause 1   !Smooth movement so eggs drop at constant speed
  Endif
Return
```

C

```
' -------------------------------------------------------
Procedure Heals
  Setcolor 0,2
  For Y=0 To Level+6 Step 2
    Put Boyx,Boyy-Y,Obj$(0),3
    Put Boyx,Boyy-Y-2,Obj$(2)
    Pause 3
    Put Boyx,Boyy-Y-2,Obj$(1),3
    Print At(2,6);Chr$(7)
    Pause 5
  Next Y
  Put Boyx,Boyy-Y-2,Obj$(0),3
  Put Boyx,Boyy,Obj$(1),3
  Print At((Boyx/8)-1,18);"      "
  Pause 10
  Setcolor 0,16
Return
' ========================== EGG ROUTINES ============================
Procedure Egg_drop
  ' This routine draws # of eggs that are falling and checks each for collision
  Numegg=0  !Start with egg #0
  Repeat
    Put Eggx(Numegg),Eggy(Numegg),No_egg$,3  !Put blank space where egg was
    Add Eggy(Numegg),Speed(Numegg)           !Move position of egg down
    Put Eggx(Numegg)+Egg_ofs(Numegg),Eggy(Numegg),Eggtype$(Numegg),7 !draw egg
    Vsync
    Add Eggx(Numegg),Egg_ofs(Numegg)      !If horizontal motion add that
    '
    If Eggy(Numegg)>158 And Boyx-10<Eggx(Numegg) And Boyx+12>Eggx(Numegg)
      ' check if boy is under egg. if so catch egg
      If Eggtype$(Numegg)<>Egg$(4)
        Put Eggx(Numegg),Eggy(Numegg),No_egg$,3
        @New_egg(Numegg)                          !Egg caught
        Add Score,49 !(Level+1)*9.6
        @Difficulty
      Else    ! If boy caught a knife, kill him
        @Stabbed
      Endif
    Endif
    '
    If Eggy(Numegg)>187-Speed(Numegg)    !Egg splat
      If Eggtype$(Numegg)<>Egg$(3)
        Put Eggx(Numegg),Eggy(Numegg),No_egg$,3
        If Eggtype$(Numegg)=Egg$(1)
          Put Eggx(Numegg),189,Egg$(2),3
        Else
          Put Eggx(Numegg),189,Egg$(4),3
        Endif
        @New_egg(Numegg)
        @Difficulty
      Else
        @Explode    ! If grenade was dropped, kill boy
      Endif
    Endif
    Exit If Dead
    Exit If Dance
    Inc Numegg
  Until Numegg>Total_eggs
Return
' ----------------------------------------------------------
Procedure Difficulty
  Dec Eggs_avaible
  Text 250,16,Int(Score)         !Change score
  If Eggs_avaible<1              !Have enough eggs fallen? If so add another
    Eggs_avaible=15+Level        !More eggs fall each level
    Inc Total_eggs               !Make more eggs fall at once
    @New_egg(Total_eggs)
    If Total_eggs>3              !If finished dropping 3 eggs at once inc level
      @Egg_clear
      Dance=True
      Total_eggs=0
      Temp_score=Score
      Inc Level
```

D

```
      Print At(Mx/8-1,18);"(Bravo)"
      If Int(Score/12000)>=Bonus_level And Lives<3
        Inc Bonus_level        !If need life and have 12000 points since...
        Inc Lives              !last extra life, give new life
        @Heals
        @New_screen
        Print At(Mx/8-1,18);"(EXTRA)"
        @Heals
        Print At(Mx/8-1,18);"(LIFE!)"
      Endif
      '
      If Level>13
        Level=0
        Add Extra,13   !Tells user round 1 is 14,after finished all 13 levels
        Add Exspeed,2
        @New_screen
      Endif
      '
    Endif
    @Score
  Endif
Return
' ---------------------------------------------------
Procedure Stabbed
  Put Boyx,Boyy,Obj$(Obj),3
  Put Eggx(Numegg),Eggy(Numegg),Egg$(4),7
  For X=4 Downto 0
    Sound 1,15,1,X,20-X
  Next X
  Pause 32
  Sound 1,0,0,0
  @Kill_man
Return
' ---------------------------------------------------
Procedure Explode
  For X=0 To 8
    Setcolor 0,5+Random(3),Random(5),0
    Sound 1,15,14,X,12-X
  Next X
  Pause 26
  Sound 1,0,0,0
  Print At(2,2);Chr$(7)
  Setcolor 0,16
  @Kill_man
Return
' ----------------------------------------------------------
Procedure Kill_man
  Dec Lives
  @Egg_clear
  If Lives=>0              !If game not over because lives left
    If Level>0             !if not first level
      Dec Level
    Endif
    Total_eggs=0
    Eggs_avaible=15
    Score=Temp_score
    Dead=True
    @New_screen
  Else
    Play=False           !Game over
  Endif
Return
' ----------------------------------------------------------
Procedure New_screen
  Cls
  Sput Playfield$
  @Score
  Text 250,16,Int(Score)
  X=2
  While X>=Lives
    Put (X+1)*14,6,No_token$,3
    Dec X
  Wend
Return
```

continued on next page

E

```
' ----------------------------------------------------
Procedure Score
  Graphmode 1
  Deftext 12,0,0,8
  Text 109,16,Total_eggs+1
  Text 174,16,Level+1+Extra
Return
' ------------------------------------------------------------
Procedure Egg_clear
  For Num=0 To Total_eggs+1
    Put Eggx(Num),Eggy(Num),No_egg$,3
    @New_egg(Num)
  Next Num
Return
' ------------------------------------------------------------
Procedure New_egg(Eeg)
  ' This routine sets up the properties a new egg,grenade,or knife will have...
  ' until it hits the ground or is caught. These properties stored in arrays
  Eggy(Eeg)=24                 !Always set to top of screen
  Eggx(Eeg)=Random(10)*16+80   !Set Random X start position
  Egg_ofs(Eeg)=0               !Begin egg with no horiz. movement
  Q=Random(10)+1               !Used to change settings
  Eggtype$(Eeg)=Egg$(1)  !Make object egg then change at lev
  '                       routines, if needed.
  Speed(Eeg)=6  !Set this egg to descend 6 pixels at a time.
  On Level Gosub Lev1,Lev2,Lev3,Lev4,Lev5,Lev6,Lev7,Lev8,Lev9,Lev10,Lev11,Lev12,
Lev13
  If Extra>12
    @Knife
    @Grenade
    Add Speed(Eeg),Exspeed
  Endif
Return
' -------------------------------------------------------
Procedure Lev1
  @Grenade
Return
' -------------------------------------------------------
Procedure Lev2
  @Angle
Return
' -------------------------------------------------------
Procedure Lev3
  @Grenade
  @Angle
Return
' -------------------------------------------------------
Procedure Lev4
  Speed(Numegg)=Random(8)+3
Return
' -------------------------------------------------------
Procedure Lev5
  @Grenade
  Speed(Numegg)=Random(8)+3
Return
' -------------------------------------------------------
Procedure Lev6
  Eggx(Numegg)=(Random(3)+8)*16
  Speed(Numegg)=Random(8)+3
  @Angle
  @Grenade
Return
' -------------------------------------------------------
Procedure Lev7
  @Grenade
  @Knife
Return
' -------------------------------------------------------
Procedure Lev8
  @Angle
  @Knife
Return
' -------------------------------------------------------
```

F

```
Procedure Lev9
  @Grenade
  @Knife
  @Angle
Return
' -------------------------------------------------------
Procedure Lev10
  Speed(Numegg)=Random(8)+3
  @Knife
Return
' -------------------------------------------------------
Procedure Lev11
  @Grenade
  Speed(Numegg)=Random(8)+3
  @Knife
Return
' -------------------------------------------------------
Procedure Lev12
  Eggx(Numegg)=(Random(3)+8)*16
  Speed(Numegg)=Random(8)+3
  @Angle
  @Grenade
  @Knife
Return
' -------------------------------------------------------
Procedure Lev13
  Eggtype$(Numegg)=Egg$(3)
  @Knife
Return
' -------------------------------------------------------
Procedure Knife
  If Q=5
    Eggtype$(Eeg)=Egg$(4)       !Object is a knife
  Endif
Return
' -------------------------------------------------------
Procedure Grenade
  If Q=3 Or Q=7
    Eggtype$(Eeg)=Egg$(3)       !Object is a grenade
  Endif
Return
' -------------------------------------------------------
Procedure Angle
  If Q<6                        !Egg offsets
    Egg_ofs(Eeg)=Rnd*2.8       !Egg moves right
  Else
    Egg_ofs(Eeg)=-(Rnd*2.8)    !Egg moves left
  Endif
Return
' ==================   HOUSEKEEPING ROUTINES   ======================
' ------------------------------------------------------------------
Procedure Screen
  Cls
  Graphmode 2
  Defline 1,3,0,0
  Color 5
  Line 0,198,320,198
  Defline 1,4,0,0
  Color 4
  Box 0,3,320,21
  X=1
  Repeat
    Put X*14,6,Token$,3
    Inc X
  Until X>3
  Deftext 3,0,0,7
  Text 60,16,"ROUND  LEVEL   SCORE"
  Sget Playfield$                    !GET COPY OF SCREEN
  @Score
Return
' ---------------------------------------------------
Procedure Fix_colors(State)       ! Saves & restores your desktop colors.
  For X=0 To 15
```

G

```
    If State=True
      Pal(X)=Xbios(7,X,-1) And &HFFF
    Else
      Setcolor X,Pal(X)
    Endif
  Next X
Return
' ---------------------------------------------------------------------------
Procedure Talk_screen
  ' Create the opening dialog screen
  Graphmode 2
  For X=2 To 7
    Deftext X,16,0,66
    Text 28+X,34-X,"B A R R A G E"
  Next X
  Defline 1,3,4,4
  Color 3
  Line 10,43,280,43
  Color 4
  Line 10,40,280,40
  Deftext 5,0,0,4
  Text 34,196,"PRATT & EVERMANN     (c)1988  ANTIC PUBLISHING"
  Deffill 3,1,1
  Pbox 76,91,200,138
  Deffill 4,1,1
  Pbox 80,87,204,134
  Pbox 8,162,138,188
  Pbox 148,162,278,188
  Deftext 7,0,0,6
  Text 98,96,"HIGH  SCORE"
  Text 98,118,"YOUR  SCORE"
  Deffill 3,1,1
  Pbox 10,160,140,186
  Pbox 150,160,280,186
  Deftext 7,16,0,11
  Text 18,178,"P L A Y"
  Text 158,178,"E X I T"
  Sget Talk$
  Cls
Return
' -------------------------------------------------------------
Procedure Talk
  ' Create the opening dialog window
  While Btn<>0
    Mouse Mx,My,Btn
  Wend
  Graphmode 2
  Defmouse 5
  Play=True
  Boyy=56
  Setcolor 0,2
  Deftext 1,0,0,7
  Setcolor 0,2
  Sput Talk$
  Text 139-(Len(Str$(Int(Hi_score)))*5),108,Int(Hi_score)
  Text 139-(Len(Str$(Int(Score)))*5),130,Int(Score)
  While Btn=0 Or My<159
    Mouse Mx,My,Btn
    @Wiggle
    '     Print At(2,12);Mx,My
  Wend
  If Mx>143
    Play=False
  Endif
  Cls
  While Boyy<164        !Boy falls to bottom of screen
    Put Boyx,Boyy,Obj$(0),3
    Add Boyy,4
    Put Boyx,Boyy,Obj$(1),3
    Pause 2
  Wend
  Boyy=166
  Print At(2,2);Chr$(7)
```

H

```
  Setcolor 0,16
Return
' --------------------------------------------------------------------
Procedure Wiggle
  Put W,Boyy,Obj$(0),3
  Showm
  W=Random(4)+130
  Put W,Boyy,Obj$(2),3
  Showm
  Pause Random(8)+4
  Put W,Boyy,Obj$(3),3
  Showm
  Pause Random(8)+4
Return
' ---------------------------------
Procedure In_hi_score
  ' Save the high score to a file.  Create a file if needed
  On Error Gosub Err
  Reopen:
  Open "R",#3,"HI_SCORE.EGG"
  Input #3,Hi_score              !if Hi_score file exists, open and get hi score
  Print Chr$(7)
  Close #3
Return
' ----------------------------------------
Procedure Err
  Write #3,0             !if no file, create new file with "0" as hi score
  Close #3
  Resume Reopen
Return
' ---------------------------------------------------------------------
Procedure Assign_objects
  ' This procedure physically pokes the objects into screen memory
  ' then uses the GET command to put them into an array.
  Get 0,0,15,30,Obj$(0)
  Get 0,0,15,7,No_egg$
  Get 5,2,11,12,No_token$
  For X=0 To 15
    Setcolor X,16    !BLACKOUT SCREEN SO SCREEN POKING IS HIDDEN
  Next X
  Restore Obj_data
  For Boys=1 To 3
    For X=0 To 30
      Read Plane1,Plane2,Plane3,Plane4
      ' poke object into screen memory
      Dpoke Scr_mem+X*160,Plane1
      Dpoke Scr_mem+X*160+2,Plane2
      Dpoke Scr_mem+X*160+4,Plane3
      Dpoke Scr_mem+X*160+6,Plane4
    Next X
    ' put object into array
    Get 0,0,16,30,Obj$(Boys)
  Next Boys
  Get 5,2,11,12,Token$
  Restore Egg
  Q=1
  Repeat
    X=0
    Repeat
      Read Plane1,Plane2,Plane3,Plane4
      ' poke object into screen memory
      Dpoke Scr_mem+X*160,Plane1
      Dpoke Scr_mem+X*160+2,Plane2
      Dpoke Scr_mem+X*160+4,Plane3
      Dpoke Scr_mem+X*160+6,Plane4
      Inc X
    Until X=8
    Get 0,0,16,7,Egg$(Q)
    Inc Q
  Until Q=5
  Cls
Return
' -----------------------------------------------------
```

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I

```
Procedure Do_color     !SET SCREEN COLORS
  Restore Kolor_data
  For X=0 To 15
    Read Kol
    Setcolor X,Kol
  Next X
Return
Kolor_data:
Data 16,1792,1284,1312,7,116,5,1365,546,102,68,1859,1911,1360,1586,1840
' ---------------------------------------------
Obj_data:
Rem   stand boy
Data 8192,8192,0,8192
Data 12290,12290,0,12290
Data 12294,12294,0,12294
Data 12294,6,12288,6
Data 29670,992,28678,28672
Data 30263,2032,29127,455
Data 29847,1712,29543,29344
Data 30711,2032,28679,996
Data 30711,1904,28679,6007
Data 31183,992,31279,13280
Data 14350,2032,14798,2046
Data 14798,1584,14798,4080
Data 6604,1584,6604,5808
Data 7148,1584,7148,1724
Data 6152,2032,6152,6128
Data 2920,1168,2056,2040
Data 2920,1168,2056,4080
Data 2056,2032,2056,2040
Data 2056,2032,2056,4080
Data 0,4088,0,4088
Data 0,4088,0,4088
Data 0,3960,0,3960
Data 0,3960,0,3960
Data 0,3960,0,3960
Data 0,3960,0,3960
Data 0,3960,0,3960
Data 0,3960,0,3960
Data 3960,0,0,3960
Data 3960,0,0,3960
Data 1584,1584,0,1584
Data 1584,1584,0,1584
Rem   * 1 by 32 words
Rem   leftboy
Data 0,0,0,0
Data 16384,16384,0,16384
Data 24576,24576,0,24576
Data 24580,24580,0,24580
Data 24588,12,24576,12
Data 59340,1996,57344,57356
Data 60524,4064,58252,896
Data 59694,3424,59086,58702
Data 61422,4064,57358,1984
Data 61422,3808,57358,12008
Data 62366,1984,62558,26560
Data 28700,4064,29596,4092
Data 29596,3168,29596,8160
Data 13208,3168,13208,11616
Data 14296,3168,14296,3448
Data 12304,4064,12304,12256
Data 5840,2336,4112,4080
Data 5840,2336,4112,8160
Data 4112,4064,4112,4080
Data 4112,4064,4112,8160
Data 16,8160,16,8176
Data 0,16368,0,16368
Data 0,16120,0,16120
Data 0,15480,0,15480
Data 0,14396,0,14396
Data 0,14396,0,14396
Data 0,14366,0,14366
```

J

```
Data 14350,0,0,14350
Data 14350,0,0,14350
Data 12294,12294,0,12294
Data 12294,12294,0,12294
Rem   * 1 by 32 words
Rem   rightboy
Data 0,0,0,0
Data 2,2,0,2
Data 6,6,0,6
Data 8198,8198,0,8198
Data 12294,12288,6,12288
Data 13287,13280,7,12295
Data 13879,2032,12743,448
Data 29847,1712,29543,29351
Data 30711,2032,28679,992
Data 30711,1904,28679,6004
Data 31183,992,31279,998
Data 14350,2032,14798,16368
Data 14798,1584,14798,2040
Data 6604,1584,6604,1716
Data 7148,1584,7148,7856
Data 2060,2032,2060,2036
Data 2920,1168,2056,4080
Data 2920,1168,2056,2040
Data 2056,2032,2056,4080
Data 2056,2032,2056,2040
Data 2048,2040,2048,4088
Data 0,4092,0,4092
Data 0,8060,0,8060
Data 0,7740,0,7740
Data 0,15388,0,15388
Data 0,15388,0,15388
Data 0,30748,0,30748
Data 28700,0,0,28700
Data 28700,0,0,28700
Data 24588,24588,0,24588
Data 24588,24588,0,24588
Egg:
Data 0,0,0,0
Data 128,256,0,384
Data 448,512,0,960
Data 256,512,192,960
Data 0,512,448,960
Data 0,512,448,960
Data 320,512,128,960
Data 128,256,0,384
Rem   splategg
Data 0,0,0,0
Data 0,0,0,0
Data 0,0,0,0
Data 0,0,0,0
Data 1792,1792,1792,1792
Data 4064,4064,16352,16352
Data 6072,6072,65532,65532
Data 28,28,31,31
Rem   grenade
Data 896,0,896,896
Data 1280,0,1280,1280
Data 896,128,512,512
Data 1984,1600,0,0
Data 1984,1152,0,0
Data 1984,1024,0,0
Data 1984,1344,0,0
Data 896,640,0,0
Rem   knife
Data 896,896,896,896
Data 768,768,768,768
Data 4032,4032,4032,4032
Data 768,128,0,896
Data 256,640,0,896
Data 256,512,0,768
Data 256,512,0,768
Data 256,0,0,256
```

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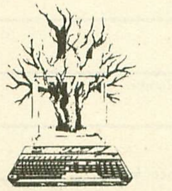
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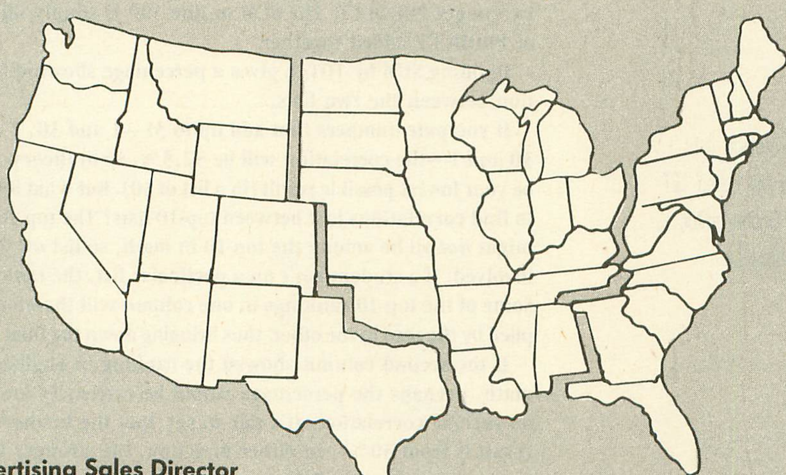
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Tech Tips

HIGHSCORE

In the November/December 1987 issue of Page 6, Ian Finlayson published this routine that uses the forced-read mode to update high scores in computer games:

```
31210 TT7=0
31220 HIGHSCORE=TT7:RETURN
31230 IF HIGHSCORE<=T77 THEN RETURN
31240 GRAPHICS 0:? :? :? "31210 TT7="; HIGHSCORE
31250 ? :? :? "CONT"
31260 POSITION2,0:POKE 842,13:STOP
31270 POKE 842,12:SAVE "D:GAME":RETURN
```

***Antic** pays $25 for every original and exclusive Tech Tip submission that we publish. Send your 8-bit or ST disk and printout to: Antic Tech Tips, 544 Second Street, San Francisco, CA 94107. Tech Tips welcomes very short programs that demonstrate the Atari's powers, simple hardware modifications, or useful macros for popular software.*

APPEND

Let's say you've written your own mailing list program and want to be able to append data to a file called LETTERS.DAT. Charles Jackson, **Antic** Technical and Online editor, suggests that beginners try the following subroutine:

```
10000 TRAP 11000:CLOSE #1:OPEN
#1,4,0,"D:LETTERS.DAT":GOTO 11010
11000 CLOSE #1:OPEN #1,8,0,"D:LETTERS.DAT"
11010 CLOSE #1:OPEN #1,9,0,"D:LETTERS.DAT"
12000 TRAP 40000:RETURN
```

Line 10000 first sets a trap, then tries to open LETTERS.DAT. If no LETTERS.DAT exists on the disk, instead of generating an error, the computer goes to the line at which the trap was set: 11000, which creates the file. If LETTERS.DAT *does* exist, the subroutine goes to line 11010, which OPENs the file and appends the data. The TRAP 40000 in line 12000 turns off the trap.

CORRELATIONS

If you're a teacher, perhaps you want to find a way to express the similarity (or lack thereof) between your students' scores in two different subjects—say, science and math. Once you've *ranked* those scores, this little program by Gregg Pearlman, *Antic* Assistant Editor, can show how *similar* the two lists of *rankings* are. Just be careful *where* you input what.

```
10 Y=0:TOTAL=0:SUM=0
20 ?"NUMBER OF STUDENTS: ":INPUT STUDENTS
30 FOR X=1 TO STUDENTS
40 Y=X*X
50 TOTAL=TOTAL+Y
60 NEXT X
70 FOR PLACES=1 TO STUDENTS
80 ?"RANKING FOR #";PLACES;": ";:INPUT P1,P2
90 PRODUCT=P1*P2
100 SUM=SUM+PRODUCT
110 NEXT PLACES
120 PCT=SUM/TOTAL
130 ? "CORRELATION: ";PCT
```

After you type the number of students (say, 30), lines 30 through 60 *square* each number from 1 to 30 and add them up (9,455) to get TOTAL.

Lines 70 and 110 prevent you from entering data for more than those 30 students. Line 80 asks you to type the *rankings* for the each student's science and math scores, and line 90 multiplies the two to get PRODUCT. The SUM in line 100 is simply all the values of PRODUCT added together.

Dividing SUM by TOTAL gives a percentage showing the correlation between the two lists.

If you pair numbers that add up to 31—1 and 30, 2 and 29. . . 30 and 1—the correlation will be 52.5%, so in theory, that would be your lowest possible result (in a list of 30). But what if you wanted to find correlations just between top-10 lists? The top 10 in science might *not* all be among the top 10 in math, so list *all* the students involved. If a student isn't on a particular list, the ranking is *zero.* Some of the top-10 rankings in one column will therefore be multiplied by the zero in the other, thus bringing down the final percentage.

If the second column showed the ranking in English instead of math, perhaps the percentage would be extremely low—showing an *inverse* correlation. It's fair to say that the further away your result is from 50%—in either direction, the stronger the correlation (or *inverse* correlation).

You can use more than two lists, if you want—say, if you decided to see how strong the relationship involving science, math and music. Make these changes:

```
40 Y=X*X*X
80 INPUT P1,P2,P3
90 PRODUCT=P1*P2*P3
```



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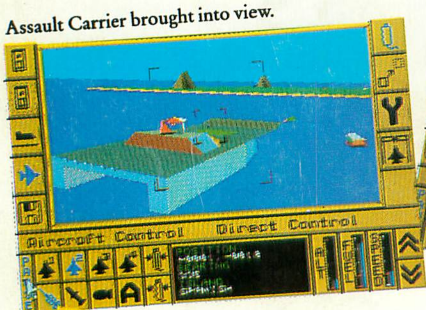
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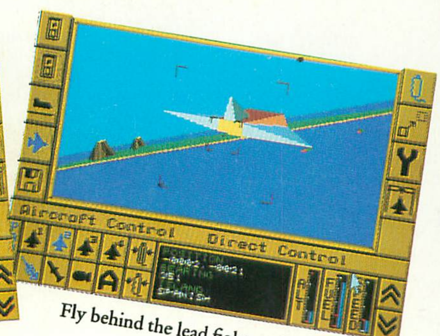
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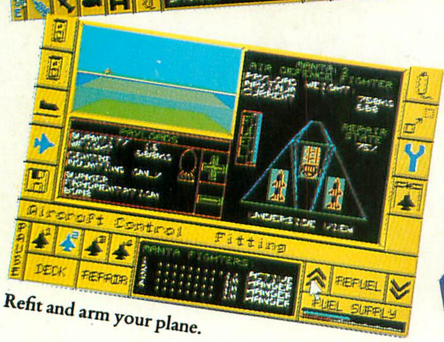
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